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THESIS

**FTS2000:
FAILED INCENTIVES,
LESSONS LEARNED**

by

LCDR Brian E. Riehm

March, 1992

Thesis Advisor:

Dr. William R. Gates

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FTS2000:
Failed Incentives,
Lessons Learned

by

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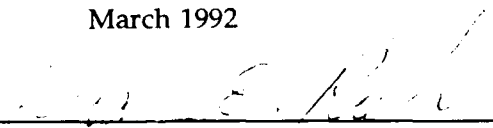
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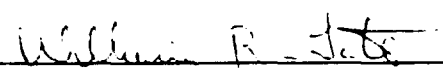
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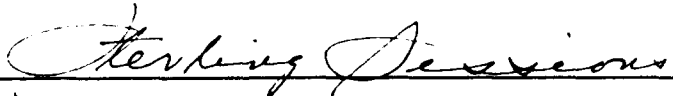
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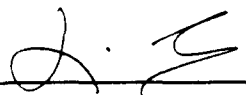
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ABSTRACT

The FTS2000 program provides the federal government with a nationwide long-haul telecommunications network incorporating voice, data, and video communications. Since its inception, controversy and Congressional inquiry have plagued the FTS2000 program and its managers at the U.S. General Services Administration. This thesis analyzes the reasons for FTS2000's management difficulties. The causes of difficulty analyzed include the role of stakeholders, especially Congress, poor incentives to the FTS2000 vendors, and technical difficulties in providing services. Following the analysis, recommendations are made for the improvement of the program. Changes in the contract structure to alter the incentives offered the FTS2000 vendors are proposed. The probable effect of these changes on the relations between the U.S. General Services Administration and Congress, the FTS2000 vendors, and the federal user agencies is also analyzed.

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I. INTRODUCTION

A. BACKGROUND AND PURPOSE

The Federal Telecommunications System 2000 (FTS2000) program is the most complex telecommunications program ever undertaken by the federal government of the United States. FTS2000 provides the government with two long-distance networks offering switched voice, data and video communications services. Its use is mandatory for all federal agencies and departments, albeit with certain exceptions. Since even before its inception, FTS2000 has been plagued by controversy and difficulties. Questions have been raised concerning the program's cost, the effectiveness of its management and the delivery of services.

Because of the FTS2000 contract's size and scope, its difficulties have a far-reaching impact on the operations of the federal government. Further, the federal government is spending a significant amount of money on FTS2000, between \$300 and \$350 million per year. Given its significant cost and wide scope, resolving the FTS2000 management difficulties would be of great benefit to the federal government. The purpose of this thesis is to analyze the program's sources of difficulties, summarize the lessons learned and provide recommendations to improve the administration of FTS2000.

B. SCOPE, METHODOLOGY AND SOURCES

1. Scope

The framework for the analysis of FTS2000 is a case study methodology. The time period for this case extends from the program inception in 1988 to the end of 1991. Further, the discussion and analysis of the program extends to the historic, managerial, pricing, and technical aspects of FTS2000. Analyses of other government telecommunications programs are beyond the scope of this thesis. However, features of other programs are introduced as alternate structures for FTS2000.

2. Methodology

The methodology for analyzing the technical aspects and pricing features of FTS2000 is drawn from the discipline of microeconomics. Two central ideas from that discipline illuminate the analysis. The first concept is that to optimize resource allocation, the marginal benefit of an action should just equal its marginal cost. While this thesis is not a cost-benefit analysis, it does examine the cost-benefit trade-offs that are inherent in the FTS2000 contract. It further examines the ways in which the program structure has hidden these trade-offs from managerial view. The second principal is that small changes in contract incentives can produce large changes in behavior. This thesis examines the manner in which pricing incentives have affected participant behavior and how a different set of incentives might change that behavior. Lastly, the analysis examines how changes to the FTS2000 program must satisfy the important stakeholders in the program if they are to be successfully implemented.

3. Sources

The public comments of these stakeholders are the most important source of information for this thesis. The comments of Congressmen, U.S. General Services Administration (GSA) officials, government telecommunications managers as well as officials of all the long distance carriers were widely reported in the trade press. Other important sources of information were personal interviews with both GSA officials and Department of Defense officials close to the FTS2000 program. Further, internal government memoranda were reviewed for evidence as to the most important concerns of the FTS2000 stakeholders. Lastly, FTS2000 technical documents, as well as FCC tariffs, were consulted to confirm details provided from other sources.

4. Literature Review

The sources listed above provide a wealth of factual information concerning FTS2000. However, no comprehensive study of the FTS2000 program exists on which to build. Some specific issues were analyzed in two reports from the U.S. General Accounting Office (GAO), published in 1991. The first of these reports was titled *TELECOMMUNICATIONS, GSA'S Difficulties Managing FTS 2000*. It focused on alleged contract administration improprieties at GSA. The second GAO report was titled *FTS 2000, GSA Must Resolve Critical Pricing Issues* and analyzed the extent to which FTS2000 prices were higher than for comparable commercial contracts. Other studies relevant to FTS2000 were performed by the MITRE corporation for GSA, specifically relating to pricing issues. However, only a small portion of one study by MITRE was made publicly available.

C. ORGANIZATION OF THE THESIS

Given the lack of previous work concerning FTS2000, a large amount of factual information is necessary to understand this case. As such, three chapters are devoted to spelling out the case issues. Chapter II gives the historic background of the case, emphasizing the fractious nature of GSA's relations with Congress and their underlying causes. The pricing provisions of the FTS2000 contract are examined in Chapter III along with their historic impact. Chapter III also examines the current state of the telecommunications industry to place pricing issues in proper perspective. The final portion of Chapter III examines the manner in which GSA has priced FTS2000 services to the government agencies who use the network. How those agencies view the delivery of FTS2000 services is the main focus of Chapter IV. Also, technical problems with the delivery of services are examined in that chapter.

The factual information of the previous three chapters is tied together in Chapter V. This chapter analyzes the causes and inter-relationships among the major issues. Chapter V also analyzes an alternative to the present structure of the FTS2000 program. It is followed by the final chapter, which presents the conclusions and recommendations. The final chapter is followed by Appendix A which presents the details of FTS2000 service offerings and their associated pricing structures. Readers who are unfamiliar with the range of services available may wish to read Appendix A first. However, a brief overview of those services is provided in the following chapter, entitled, FTS2000 Program History.

II. FTS2000 PROGRAM HISTORY

This chapter traces the history of FTS2000 from its roots in the old Federal Telecommunications System (FTS) until the end of 1991. The rationale behind the FTS2000 architecture and the need to replace the FTS are explored. Then the initial successes of the program are outlined. These successes were followed by increasing controversy, culminating in a series of damaging Congressional investigations and reports in the year 1991. The sources of these historic difficulties are examined in this chapter.

A. THE OLD FTS

The forerunner to the current FTS2000 program was the Federal Telecommunications System (FTS). It was placed in operation in 1963 as a circuit switched network providing a low cost voice and low speed data network for the federal government (Hills, 1987, p.8). The American Telephone and Telegraph Co. (AT&T) owned most of the switching equipment and provided end-to-end management of the system (Hills, 1987, p.10). While this system provided low cost services to the government, it was not very flexible. The General Services Administration (GSA) encouraged those agencies with specialized voice service requirements to make their own arrangements outside the system (Campen, 1990, p.41).

Changes in the telecommunications environment in the 1980s brought major problems to the administration of the FTS including: degraded system quality, inadequate

service, scarcity of good management information and rising costs (Hills, 1987, p.11). The old FTS did not provide adequate capacity to meet users' needs for high speed data transfer (Hills, 1987, p.11). Further, FTS lacked real time reporting, making it hard to respond to system status. Additionally, the billing method was antiquated and did not provide user agencies with adequate information to manage telecommunications costs (Hills, 1987, p.13). Lastly, by 1983 the cost savings for the FTS had been almost completely eroded by competitive pressures and an FCC ruling which caused AT&T to withdraw its TELPAK tariff. (The FCC had ruled that MCI could take advantage of AT&T's TELPAK offering.) TELPAK had been offered to the government under the FTS program and was substantially below comparable commercial rates (Hills, 1987, p.14). These problems, and the breakup of AT&T, brought into question the very existence of the FTS.

B. FTS2000: INITIAL PROGRAM DESIGN

In this atmosphere of upheaval and glaring problems with the FTS, GSA commissioned a study to determine the architecture required to replace the FTS. The name of the system, FTS2000, came from the recognition that this Federal Telecommunications System was to provide for government needs beyond the year 2000. Four proposals were evaluated:

- Independent agency procurement of telephone services.
- GSA purchase of an intercity backbone only.
- Single Vendor providing service through a single system.

- Multiple vendors providing service through multiple systems.

In 1986, GSA settled upon the single vendor approach and began preparations to let the FTS2000 contract. (Hills, 1987, pp.36-43)

In 1987, both the House Government Operations Committee and the Senate Government Affairs Committee challenged GSA management of the FTS2000 program. A critical question was whether GSA had essentially defeated the intent of the Modified Final Judgment (governing the AT&T divestiture) by utilizing a sole source contract (Hills, 1987, pp.74-75). (The underlying assumption of that argument was that AT&T would have won a sole source award, an assumption proved correct by events.) The final architecture of FTS2000 was the product of intense and often acrimonious political negotiation, both within the Executive Branch and with Rep. Jack Brooks (D-TX), then chairman of the House Government Operations Committee, whose insistence on competition shaped the final system configuration (Campen, 1990, p.43).

The final architecture called for two separate networks, known as Network A and Network B (or Net A and Net B). Network A was to be awarded to the lowest bidder and receive a 60% share. Network B was to be awarded to the second lowest bidder and receive the remaining 40% of the network. The Request for Proposals for FTS2000 specified that the 60/40 split was based on FTS voice grade traffic as of February 1986 and would be allocated on a whole agency basis. (RFP, 1988, p.C-15).

The scope of the contract is vast. All government agencies requiring long haul telecommunications for voice, video, or data are required to obtain those services under

the FTS2000 auspices. This broad mandate has resulted in a contract valued by industry analysts at \$25 billion (Campen, 1990, p.41). The overall contract is managed by the General Services Administration. For the purpose of the contract, a user agency is defined as a department, agency, or corporation of the federal government such as the Treasury Dept., Veterans Administration, or the U.S. Postal Service. Examples of services offered under the FTS2000 contract include high-speed facsimile, wide-area networks for data and image transfers, electronic mail, video-conferencing and toll-free "800" lines (Knauth, 1990, p.29). The system is intended to provide management with much more accurate billing and usage information, to curb excesses and abuse (Hills, 1987, p.13). Additionally, GSA provides usage analysis to government agencies, so that they may receive the best rate for the service they require (Smith, 1991). However, the effectiveness of this support is questionable. Many agencies use special software developed by Centel, a private firm, to optimize their use of FTS2000 (Richardson, 1991a, p. 18). This software is used because agencies feel that GSA and vendor support of usage analysis has not provided adequate information for the agencies to optimize their mix of FTS2000 services. (Richardson, 1991a, p. 18).

Exceptions to the mandatory use of FTS2000 may be made by GSA where FTS2000 does not meet the technical requirements of the requesting agency. Further, certain quasi-governmental agencies, such as the Federal Reserve Board and the U.S. Postal Service, may be exempted, although this is a point of contention. The House of Representatives and the Senate are exempted, as well as certain portions of the Department of Defense. (Taff, 1991a, p.18)

The specific services called for under the FTS2000 contract are:

- Switched Voice Service (SVS)
- Packet Switched Service (PSS)
- Switched Data Service (SDS)
- Dedicated Transmission Service (DTS)
- Video Transmission Service (VTS)

A sixth offering, Switched Digital Integrating Service (SDIS), is not a class of service but a method of accessing other services (GSA, 1989, p.3-15). Details of each service are contained in Appendix A. It is important to note that despite the ever increasing importance of data communications to the federal government, voice services still account for between 80% and 90% of the revenue on FTS2000, depending on what source is quoted.

C. INITIAL IMPRESSIONS: SMOOTH SAILING

In December 1988, GSA awarded the FTS2000 contract to AT&T at a 60% share and to US Sprint at a 40% share (Campen, 1990, p. 41). The contract was let as a ten-year, indefinite delivery contract, with internal recompetitions scheduled for the fourth and seventh years of the contract. MCI came away a disgruntled loser, with no share of the FTS2000 contract (Campen, 1990, p. 41). On October 11, 1989, the physical network became fully operational and FTS2000's initial phase made its flawless debut (Lewyn, 1989, p. 156). The next phase of the contract called for shifting over federal agencies

from the old FTS to the new system. US Sprint finished shifting over its assigned agencies in May 1990 and AT&T finished its shift in June 1990, 18 months ahead of schedule (Knauth, 1990, p.29). Multiple sources indicate that the process of shifting agencies was well managed and caused a minimum of disruption at the federal agencies affected. By completing the shift ahead of schedule and shutting down the old FTS early, GSA estimated that it saved the federal government approximately \$17 million (IMC, 1990, p.2).

Further, the prices charged under the contract were initially thought to be a good bargain for the government. GSA initially estimated annual savings of \$150 million over the old FTS, due to less expensive switched voice rates. In mid-1990, a five minute mid-day call from Washington to San Francisco would have cost \$1.40 on AT&T's commercial network but roughly half that on FTS2000. However, even in the early phases of the program, many government agencies expressed skepticism over these projected cost savings, feeling that they could have obtained similar savings with greater flexibility on their own. (Knauth, 1990, pp.29-30)

Initially, the most serious threats to the contract were thought to be legal challenges from losers in the bidding process. As part of the FTS2000 contract, GSA included a clause that grants the two contractors first rights to sell system upgrades that were not specified in the original Request for Proposals (RFP). MCI, which was not selected as an FTS2000 contractor, charged this to be an illegal open ended contract which will lead to a de-facto monopoly by AT&T and US Sprint. Further, a small telecommunications firm in Kansas City filed suit claiming that the FTS2000 contract is monopolistic and unfairly

blocks small and minority-owned firms from entering the federal market. To date, the government has survived these legal challenges without having to modify the FTS2000 contract. (Knauth, 1990, pp.31-32)

However, MCI kept up a steady propaganda barrage against the FTS2000 contract. In February 1991, MCI announced a Government Telecommunications (GTS) Tariff that they claimed would charge agencies 40% less for voice calls than they would pay under FTS2000 contracts. Predictably, AT&T and US Sprint claimed that MCI's service was not comparable, as it only covered voice services and only offered two of nine features of FTS2000. (Richardson, 1991b, p.4)

Because MCI never had a realistic chance of receiving FTS2000 business with its GTS tariff filing, some industry analysts suggest that the purpose of MCI's announcements was political (Taff, 1991a, p.13). It should be noted that MCI claims to have sold services under its GTS tariff to government agencies not required to use FTS2000, such as the House of Representatives (Taff, 1991a, p.13). While it is true that the House of Representatives uses MCI as its long distance carrier, it is not clear whether the House contract is covered under the GTS tariff. MCI refused to divulge what other government agencies are using GTS (Taff, 1991a, p.13). US Sprint claims that MCI has not sold any services to the government under GTS (Payne, 1992). When asked to respond for this thesis, MCI officials refused comment on any aspect of GTS. Regardless of the amount of business GTS has generated, the effects of MCI's campaign are hard to measure. As will be discussed later, around the same time as MCI's announcement, Congressional attention became focused on the costs of the program and its management. MCI's

publicity may have had an impact. MCI is worried that enormous profits from the contract are allowing US Sprint and AT&T to subsidize their commercial contracts with government revenues, to MCI's detriment (Bass, 1991a, p.37).

D. DEPARTMENT OF DEFENSE PARTICIPATION

The initial Department of Defense (DoD) reaction to the FTS2000 initiative was to claim exemption from any requirements to participate in the system. However, in October 1988 GSA started to question DoD's stance. Public Law 89-306 (commonly known as the Brooks act) as revised under the Warner amendment is specific about the requirement for DoD participation and effectively ended DoD's claim for exemption (Byaird, 1991). In March 1990, the DoD reached agreement with GSA on the scope of its participation in FTS2000. The agreement included non-Warner exempt long distance, WATS, and "800" services. (Kitfield, 1990, p.32). The addition of the Defense Department promised to greatly increase the value of the contract. Based on various news accounts, \$80 million is an approximate figure for the potential annual revenues from the Department of Defense. By way of comparison, in March 1991, annual revenue for the system stood at \$300 million (Strauss, 1991, p.24).

The term "Warner exempt" refers to the Warner amendment (10 U.S.C., Section 2315) which exempts certain classes of military communications from GSA jurisdiction. Examples include command and control functions, intelligence activities, and cryptologic activities. In September 1990, the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (ASDC3I) issued a policy memorandum outlining DoD

policy regarding FTS2000. The policy required all military agencies seeking long haul telecommunications within the western hemisphere to obtain these services under the auspices of the FTS2000 program, except where the services were "Warner exempt." (Andrews, 1990, pp.1,2-2)

The other exception concerning DoD telecommunications requirements occurs when the communications requirement can be filled without expending appropriated funds. This might be accomplished by integrating into an already existing system. Such systems are called "common user systems." One example of such a system is the Defense Communications System (DCS). The rationale for this exception is that the law governing FTS2000 mandatory use is part of each year's appropriations bill, so use is mandatory only when new funds are being appropriated to meet the telecommunications needs. (Barrow, 1991)

E. DOD PARTICIPATION LEADS TO CONGRESSIONAL INQUIRY

In May 1990, GSA had assigned all Department of Defense (DoD) agencies to AT&T's Network A (Taff, 1991b, p.10). Meanwhile, GSA was attempting to resolve a long simmering dispute with US Sprint concerning alleged price cap violations. (Price cap mechanisms and history are discussed at length in Chapter III.) In October 1990, to resolve the dispute, GSA agreed to give US Sprint more business in return for rate decreases (GAO, 1991a, pp.3,4). GSA then reassigned the Navy and Marine Corps to US Sprint's Network B. AT&T protested the Navy's shift to Network B, claiming that the effect would be to deny it the 60% share of revenue it won in the initial bidding (Taff, 1991b, p.9). At the time of the protest, AT&T claimed it had received only 43% of the

contract revenue, far short of the 60% expected (Taff, 1991b, p.9). (Some sources put the split at 53%-47% in favor of US Sprint, but the point is that US Sprint had more revenue than AT&T). Significantly, AT&T also charged that the shift of Navy to Network B was the result of illegal deal making between GSA and US Sprint (Taff, 1991b, p.9).

While AT&T lost its protest to the Board of Contract Appeals, its successful lobbying led directly to a Congressional inquiry into GSA's management of the supposed 60/40 split, beginning in April 1991. Figure 1 shows the history of the revenue split up to the time of the Congressional hearings.

This round of Congressional inquiry threw a new glare of publicity on GSA's management of the contract, with John Conyers and John Glenn becoming increasingly vocal in their criticism of GSA's management. To aid the reader in understanding the following discussion of Congressional inquiry, Figure 2 identifies the major figures concerned with FTS2000.

The Congressional leadership had several goals as it re-opened oversight hearings into FTS2000. The first was to force GSA to rectify AT&T's lack of business by restoring the Navy to Network A. The second was to force GSA to create an assistant administrator position responsible for the management of FTS2000. The assistant administrator would presumably be more responsive to Congressional input than Michael Corrigan had been as deputy commissioner for Telecommunications Services. Lastly, Congress wanted pressure GSA to obtain price concessions from the two vendors. GSA Administrator Austin was reluctant to accept any such guidance from Congress, but as often happens in Washington, he proved no match for powerful committee chairmen.

Andrews, Duane P.: DoD, Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASDC31)

Austin, Richard: GSA, Administrator of General Services Administration

Buckholtz, Thomas: GSA, Information Resources Management Services Commissioner

Conyers, John, (D-MI): Chairman, House Government Operations Committee

Corrigan, Michael: GSA, Assistant Commissioner for Telecommunications Services

Edgerton, Jerry: MCI, Vice President of Government systems

Forsee, Gary: U.S. Sprint, Former President, Government Systems Division

Glenn, John (D-OH): Chairman, Senate Government Affairs Committee

Hall, Carol: GSA, Contracting Officer for FTS2000

Johnson, Rebekah T. GSA, Deputy Administrator, Resigned in June 1991

Lombardi, Richard: AT&T, Vice President for Federal Systems

Scott, Donald: GSA, Asst. Administrator for FTS2000, appointed Aug 91

Rooney, Chris: US Sprint, President, Government Systems Division

Figure 1 Major Participants concerned with FTS2000

During Government Operations Committee hearings held in April, 1991, the overpricing charges against US Sprint were made public by GAO officials. GAO criticism of the management of the 60/40 split was also aired. GSA Administrator Richard Austin, defending his agency's management of FTS2000, vowed to achieve the 60/40 split by October, 1991. Committee Chairman John Conyers and AT&T both issued statements that they doubted that GSA could achieve the required split. During these hearings it was also revealed that US Sprint had threatened to quit the program if pressed on the overcharge issue. (*Electronic News*, 1991, p.6)

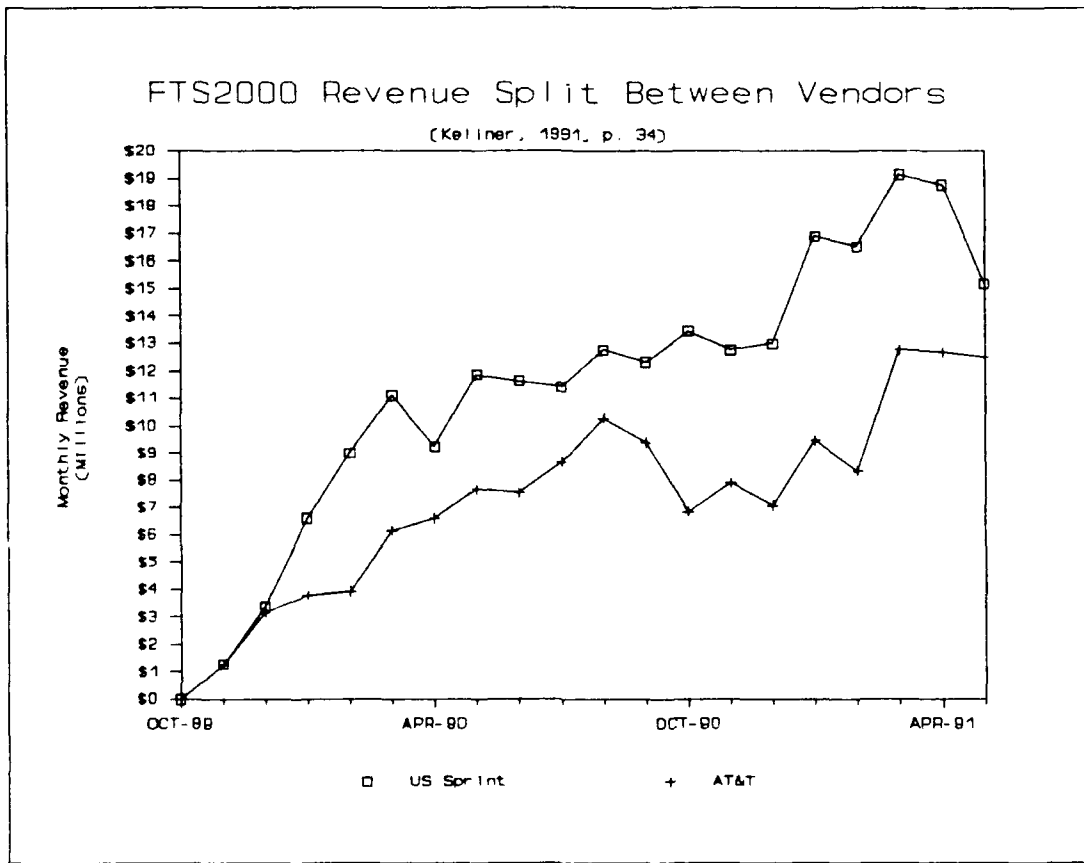


Figure 2 History of Revenue Split between Vendors at Start of Congressional Hearings

These irregularities were confirmed by testimony from GSA's FTS2000 contracting officer, Carol Hall. US Sprint's threat to quit and the deal making to give US Sprint the Navy business were also described (Messmer, 1991a, p. 7). Incredibly, Michael Corrigan testified that he was not consulted about the shift of the Navy to US Sprint, nor was Richard Austin (Richardson, 1991c, p.53).

US Sprint's president of its Government Systems Division, Chris Rooney, defended the revenue share it had received. He testified that the 60/40 split was intended to mean potential business and that US Sprint had more successfully marketed its services and

therefore deserved the additional revenue (*Edge*, 1991, p.2). Indeed, sources within DoD indicated in personal interviews that AT&T was much slower in switching DoD users to FTS2000 than US Sprint. This was attributed to the fact that AT&T held the bulk of temporary telecommunications contracts while DoD agencies awaited connection to FTS2000. These contracts were particularly lucrative to AT&T, because high rates were charged due to their temporary nature (\$.18/min vs about \$.13/min for FTS2000 voice) (*Kleyn*, 1991). In May, US Sprint sent a letter to the House Government Operations Committee making that very same allegation, which AT&T denied (*Richardson*, 1991d, p.33). In personnel interviews, GSA officials expressed their belief that AT&T did not deliberately delay in implementing FTS2000 connection (*Cleveland*, 1991). However, AT&T's turn around time for new FTS2000 orders was slower than US Sprint's, though it had been continually improving (*Cleveland*, 1991).

In May 1991, Mr. Austin continued to defy the House Government Operations Committee by refusing to restore Navy to Network A (*Richardson*, 1991d, p.1). Mr. Austin cited the likelihood of litigation and the significant field work already performed by US Sprint as reasons not to shift Navy (*Richardson*, 1991d, p.33). However, one week later GSA issued a stop work order to halt the Navy's impending cutover to Sprint's Net B. Although the stop work order was initially issued for 30 days, it remained in effect until August 2, 1991. It was later revealed that the original letter refusing to shift Navy to AT&T was signed by Mr. Austin's deputy, Rebekah T. Johnson, providing further evidence of management disarray at GSA (*Richardson*, 1991e, p.4). By the end of June

1991, Ms. Johnson had resigned her post as Deputy Administrator. Richard Austin denied that the resignation was related to the FTS2000 program (Richardson, 1991e, p.4).

F. THE SENATE PLAYS CATCH-UP

While Rep Conyers (D-MI) had garnered much publicity over his investigations into the administration of FTS2000, Sen. Glenn (D-OH) sought to become more involved in the oversight process. On 24 May 1991, he sent a letter to Administrator Austin questioning certain GSA pricing practices for non-mandatory users of FTS2000 (Glenn, 1991, p.1). Sen. Glenn questioned the GSA practice of not charging levelized prices to non-mandatory users of the system. (Levelized pricing is discussed in detail in Chapter III; its essential feature is a price reduction in GSA charges to agencies served by US Sprint (the higher priced vendor) and a corresponding increase in GSA charges to agencies using AT&T. Levelization's purpose was to cause agencies to pay the same amount for the same service, regardless of which network they were on.) Senator Glenn further chastised Mr. Austin for allowing DoD to opt out of FTS2000 by using their own telecommunications systems (Glenn, 1991, p.3). This last charge may be unfair because, it appears that GSA lacked the political pull to force DoD to hew to GSA's interpretation of the Warner amendment.

In July 1991, an incident, which can only be described as bizarre, occurred involving a Senate Government Operations Committee staff members. First, staffers threatened both US Sprint and GSA officials with revoking the contract unless US Sprint agreed to price reductions on the FTS2000 contract. Then one of those staffers placed a

call to a Wall Street securities analyst, asking the effect on Sprint's parent company, United Telecommunications, if the contract was revoked. Rationale for the action may have been to threaten US Sprint by affecting the share price of its parent company. Anonymous Capitol Hill sources said that the Senate Government Affairs Committee was trying to match the power wielded by its House counterpart in directing the course of FTS2000. Ultimately, this incident only embarrassed the Senate committee and half-hearted apologies were issued to United Telecommunications. (FCW Staff, 1991, pp.1.33) No further action against the staff members involved was reported.

G. GSA RESISTANCE COLLAPSES

August 2, 1991 proved to be the single most significant day since the FTS2000 contracts were let in December 1988. On that day, Richard Austin issued a press release signalling GSA's surrender to Congress on numerous key issues of the program. First, the Navy was again shifted to AT&T's Network A. Second, GSA announced the creation of a position for assistant administrator for FTS2000. Donald Scott, director of Information Resources Management at the Department of Energy was selected to fill that role. Lastly, US Sprint announced price reductions on various FTS2000 services; most notably a 10% cut in the price of switched voice service, starting on 1 Oct 1991, with a further 5% reduction scheduled for 1 Jan 1992. US Sprint's price reductions allowed GSA to eliminate price levelization. (GSA, 1991)

In one day, GSA had obtained breathing space from Congressional critics. The elimination of price levelization resolved a big complaint of both users and Senator

Glenn. The appointment of Donald Scott as assistant administrator for FTS2000 placated John Conyers desire for someone in that new position. Further, Donald Scott's appointment was well received at DoD, where he had been employed prior to working at the Department of Energy (Barrow, 1991). Mr. Scott was also well known to key DoD personnel involved with FTS2000 from his work on the FTS2000 Interagency Management Council. Turf wars between DoD and GSA over control of Defense telecommunications procurements had led to much bitterness and DoD sniping at GSA; the appointment of Scott would hopefully help relations between the two federal agencies (Barrow, 1991). Regarding relations with Congress, the price reductions announced by US Sprint were directly aimed at GAO and Congressional complaints over the high cost of the contract to the government.

However, the loss of the Navy business created a great deal of bitterness at US Sprint. They had been looking forward to breaking AT&T's near monopoly on providing long haul services to the Department of Defense. (Griswold, 1991) Another impact of the shifting Navy to Network A was to delay the Navy's implementation of FTS2000. The Navy was the service most enthusiastic about FTS2000, largely due to the efforts of VADM Jerry Tuttle, Director of Space and Electronic Warfare (Kleyn, 1991). VADM Tuttle had envisioned using FTS2000 T-1 and T-3 circuitry as a backbone for the Global Information Exchange System (Globixs) portion of his Copernicus Command, Control and Communications architecture (Messmer, 1991a, p.4) However, placing the Navy on Network AT&T's was probably inevitable. In private discussions, GSA had promised

DoD officials to do just that after the next FTS2000 internal recompetition in 1992 (Barrow, 1991).

H. CHIEF CONTROVERSY BECOMES PRICE

GSA's August actions, while effective in relieving some pressure from Congress, did not totally end criticism of its management of the program. The Congressional leadership was now concerned with how GSA was going to reduce costs of the program in the near future. In September 1991, at the behest of John Glenn (D-OH), the Government Accounting Office (GAO) released a report titled "*FTS 2000: GSA Must Resolve Critical Pricing Issues*" (GAO, 1991b, p.1). The report ignited more controversy for the program because it reported that FTS2000 switched voice services would cost the federal government \$148 million more in fiscal years 1991 and 1992 than comparable commercial rates (Bass, 1991b, p.3). The report's accuracy was questioned by the ranking minority member of the House Government Operations Committee, Rep. Frank Horton (R-NY) (Bass, 1991b, p.3). The GAO had relied on data obtained by the MITRE corporation in a study done for GSA (Bass, 1991b, p.3). However, it appears that the GAO report is accurate. The MITRE data was collected using a method outlined in the original Request for Proposals, based on sampling of city pairs (Garbin, 1991). Significantly, AT&T and US Sprint did not question the accuracy of the report, but defended themselves by pointing out many provisions not included in normal commercial contracts (GAO, 1991b, pp.4-5).

GSA entered 1992 still facing significant challenges in its management of the program. 1992 is the first year for recompetition of the contract. (Recompetition, called price redetermination in the RFP, is a way to re-allocate revenue between the two vendors based on price and other factors. Price redetermination is discussed in detail in Chapter III.) The criteria for recompetition will be scrutinized by Congress. A failure to achieve substantial cost savings will cause a political firestorm on Capitol Hill. The next chapter examines how pricing became such a controversial topic for FTS2000.

In conducting research, one interesting observation was the strength of emotion shown by all the individuals involved in FTS2000. Both in personal interviews and in press articles participants exhibited passionate feelings seemingly out of proportion to the program's importance. It seems that the swirl of emotion which has surrounded this program has made it an extremely difficult one to manage. Defusing this emotion would seem to be a major benefit to the management of FTS2000. In Chapter 5, a different set of economic incentives and method of administration is proposed which might help reduce this tension. Examples of the hyperbolic public statements by vendors can be found in Appendix B. This appendix contains magazine advertisements released in 1991 by AT&T, US Sprint, and MCI concerning FTS2000 as well as quotes from their officials. They are included to illustrate the importance of this contract to all three major carriers. It would seem that solving the inappropriate economic incentives of the contract is the critical first step in better managing FTS2000. The next chapter examines the current pricing mechanisms of the FTS2000 program and their historic effect.

III. FTS2000 PRICING

The purpose of this chapter is to frame the issues surrounding the pricing of FTS2000 services. To place the discussion in its relevant context, an examination of the prevailing conditions in the long-distance industry is first presented. Next, the details of pricing mechanisms from the FTS2000 Request for Proposals are presented along with evidence as to their effectiveness. The effectiveness of the pricing mechanisms is further scrutinized by examining evidence about the FTS2000 prices themselves. Finally, an examination of the way that GSA charges user agencies for FTS2000 services is made. This examination is made because GSA pricing is not identical to FTS2000 vendor pricing, which therefor affects user perceptions of the program.

A. INDUSTRY CONDITIONS

A number of telecommunications industry conditions are factors that in part determine pricing for FTS2000 services. Prior to examining the issues surrounding FTS2000 pricing, several related topics must be examined, including: telecommunications industry capacity and the relative positions of the two vendors.

1. Capacity and Price

Competition in providing data and video services is pushing the telecommunications industry along at a breathless pace (Carr, 1990, p.6). New technology will continue to reduce the costs of carrying long haul telecommunications. This is because

"bandwidth, the basic commodity of the industry, is being mined from laboratories at a staggering rate." (Carr, 1990, p.10) Further, it is widely known that the major carriers' current long haul telecommunications systems have great excess capacity. The excess capacity was due in part to the major carriers' decisions to build fiber optic backbone networks, whose bandwidths are orders of magnitude greater than that of previously used media. This too is driving down the prices of long haul telecommunications.

This trend is not just a recent one. From 1940 to 1980 long distance rates declined by about 25%, while consumer prices rose by over 200% (Meyer, 1980 p.2). Furthermore, the divestiture of AT&T accelerated this trend: average long distance rates fell 54% from 1984 to 1991 (Garreis, 1991, p. 1). (When adjusted for inflation these declines are even steeper.) Despite some headlines to the contrary, this trend continued in 1991, albeit at a slower pace. Long distance rate increases on the order of one to two percent were seen in 1991, which was still below the prevailing rate of inflation. Further, large businesses negotiating custom network agreements with the major carriers have actually been able to obtain price decreases. (Garreis, 1991, p.37)

Discussions with former AT&T engineers indicate that the excess capacity will persist for many years to come (Craddock, 1991). Even if the bandwidths of the fiber optic links are filled sooner than expected, prices are unlikely to rise. Only a small fraction of the theoretical bandwidth of fiber optic cable is being used. If the current fiber backbone is saturated, more efficient signalling and switching equipment can be hooked to the same fiber optic cable. (Freeman, 1991, p.740) A glut of capacity will exist for the foreseeable future.

2. AT&T

It would be impossible to describe all facets of AT&T in this thesis. However, a few comments are in order, since AT&T manages Network A of the FTS2000 system. The position of AT&T is unique within the telecommunications industry, due in part to its status as a former regulated monopoly. It is by far the largest U.S. provider of long haul telecommunications services. Its dominance is unquestioned. In his history of the breakup of AT&T, Peter Temin argues that the smaller carriers, MCI and US Sprint, continue to exist only at the combined grace of AT&T itself and the FCC (Temin, 1987, pp.355-356).

AT&T acquiescence and FCC oversight may help create a market for MCI and US Sprint by restraining AT&T's tariff reductions. More specifically, while AT&T may no longer be a natural monopoly, it is at least the dominant member of a very small oligopoly (Temin, 1987, pp.355-356). (At the end of 1991, AT&T's share of the interstate market was still about 65%, down from about 90% in 1982 (Killette, 1992, p.37). AT&T has almost halted its erosion of market share.) Further, it must operate under the terms of the court supervised Modified Final Judgment of 1984 and continuing FCC scrutiny. MCI and US Sprint are not subject to this same scrutiny (Temin, 1987, p.360).

This regulation is important to understanding the dynamics of the FTS2000 contract. Prior to bidding on the FTS2000 contract, AT&T had to obtain approval from the FCC for Tariff 16, essentially its bid on the FTS2000 system (Garbin, 1991a). Other vendors sought to challenge AT&T's justification for this bid, categorizing the bid as a below cost buy in. AT&T has on occasion lowered FTS2000 prices in response to GSA

demands, or when justified by the relevant costs. In each case, AT&T had to first file an amendment to Tariff 16 with the FCC. In an environment of declining costs, tariff filings will lag cost decreases. This works to the government's disadvantage by slowing AT&T tariff reductions. Due to the public policy and political reasons for this regulatory regime, it is unlikely to be changed in the foreseeable future.

The large extent to which AT&T's tariffs are regulated distorts the effect competition might have on the telecommunications industry. Regulatory prices are based on historic data and averaged nationally. Thus, regulated prices are different from competitive prices (Temin, 1987, p. 338). Economic theory tells us that competition will drive prices down to the level of current long run average costs. If industry costs are decreasing over time, the regulatory process invariably holds prices higher than the current relevant costs, and higher than the price which would occur under competition. While this will work to guarantee AT&T profits, it also provides a window of opportunity for AT&T's higher cost competition (see below).

3. US Sprint

Using Southern Pacific Railway rights of way, US Sprint built the United States' first all fiber optic backbone network. US Sprint is a wholly owned subsidiary of United Telecommunications, Inc., which recently purchased GTE's remaining 19.9% interest (Keller, 1992, p.A3). US Sprint is the smallest of the three major long-distance carriers, with about a ten percent share of the market. Lately, US Sprint has seen some erosion of its market share, but cost cutting measures helped maintain profitability during 1991.

US Sprint manages Network B of the FTS2000 system. Much less information is available on its internal costs than AT&T's. Within the confines of the FTS2000 contract, US Sprint has maintained that the disclosure of pricing information violates proprietary confidentiality and would be a breach of the FTS2000 contract. It is generally assumed among knowledgeable industry sources that US Sprint's costs are higher than AT&T's. This was confirmed in a personal interview with a US Sprint official, who indicated that Sprint's FTS2000 unit costs are about 15% higher than AT&T's. The official attributed this to US Sprint's lower long distance volume (Griswold, 1991). US Sprint's inferior position is also consistent with the fact that it won the smaller share of the program. Studies of FTS2000 pricing have shown that US Sprint's prices have been significantly higher than AT&T for the same services (GAO, 1991b, p.3).

B. FTS2000 VENDOR PRICING

Pricing in the initial offering for each of the FTS2000 services was determined by competitive bid. It was not anticipated that prices would remain fixed over the life of the contract and several mechanisms to govern pricing were written into the Request for Proposals (RFP). This thesis will address only those incentives and requirements which are relevant when commercial prices for telecommunications services are declining. The relevant mechanisms are:

- The publicly available price cap (the so-called PAP cap).
- Price redetermination (recompetition at four and seven years).
- Economic price adjustment.

1. Publicly Available Price Cap (PAP cap)

In the Request for Proposals, the PAP cap provision reads as follows:

The cost of a customer-dialed 5-minute FTS2000 switched voice service call placed between 10:00 a.m. and 11 a.m., originating time, shall not exceed the lowest publicly available AT&T, MCI, or US Sprint price for a call of the same duration made from and to the same NPA/NXXs at the same time.

Publicly available prices are prices that can be obtained from readily available public documents such as Federal and State tariffs and other carrier-supplied documents which are not proprietary to a carrier and/or its customers. (RFP, 1988, p.B.7-1)

The Request for Proposals goes on to explain some other conditions for comparing types of switched voice calls. If the government determines that this requirement has been violated, the FTS2000 contractor shall be required to lower prices to the lowest publicly available. This action could be applied retroactively by requiring a rebate for past overcharges (RFP, 1988, p.B.7-1). It should be noted that this restriction covers only switched voice services. Donald E. Scott, associate GSA administrator for FTS2000, said that the government has no leverage for keeping non-switched voice prices reasonable, because the PAP cap only applies to switched voice (Masud and Power, 1991a, p.1).

The extent to which the PAP cap is effective in maintaining prices is questionable. In the fall of 1989, GSA notified both vendors that they were exceeding the price caps and asked them to lower prices. Both vendors contested GSA's interpretation of the price cap limits. In September 1990, GSA notified both vendors of rebates they owed under the price cap agreement. US Sprint protested vigorously and GSA withdrew the letter in the hopes that negotiation would achieve greater cost savings than lengthy and costly legal proceedings (GAO, 1991b, pp.3-4). GSA legal counsel had concluded that

the language of the PAP cap was not legally enforceable (Garbin, 1991a). (The letter to AT&T was also withdrawn.) GSA then negotiated a deal to give US Sprint more traffic volume in return for price concessions. It was as a result of that deal that GSA decided to switch the Navy from the AT&T portion of FTS2000, Net A, to US Sprint's Net B. Among other things, GSA decided to overlook any US Sprint overcharges for the first four years of the contract (Masud, 1991a, p.73). AT&T protested the Navy's shift to Network B, claiming that the effect would be to deny AT&T the 60% share of revenue it won in the initial bidding (Taff, 1991, p.9). The subsequent Congressional involvement was discussed in Chapter II.

In fairness, it should be pointed out that at least part of the PAP cap's ineffectiveness is due to contract language judged unenforceable by GSA counsel. Current negotiations over the new contracts include more enforceable PAP cap provisions (Garbin, 1991a). However, the government has had to put "money on the table" to obtain such contract modifications (Garbin, 1991a). What changes, if any, will be made to the PAP cap provision are unknown at the time of this writing. But the PAP cap was not considered the government's primary tool for reducing FTS2000 prices, that role was expected to be filled by price redetermination.

2. Price Redetermination

Price redetermination was seen as the best means by which the government would keep the FTS2000 prices competitive (GAO, 1991b, p. 6). At the end of the fourth and seventh years of the contract, the government can reallocate up to 40% of each vendor's estimated revenue over the remaining life of the contract (RFP, 1988, p.H.21).

To support the reallocation, the contractors are required to submit proposals for price redetermination during the fourth and seventh years. Prices proposed will remain in effect for the remainder of the contract (RFP, 1988, p.H.22). However, price alone will not govern GSA's decision to reallocate revenue share. Other factors that must be considered include:

- Service quality.
- Costs of transition.
- Impact on users and their applications.
- Alignment with agency allocations.
- Ability to maintain ongoing competition between two contractors through the remaining contract life.
- Other factors concerning price, quality, and reliability of service to the government.

(RFP, 1988, pp.H.21-H.22)

The first recompetition is scheduled for 1992 and had not been completed at the time of this writing. However, if US Sprint lost 40% of its revenue at each price redetermination, its share of revenue would fall to 14.4% at year eight. Such a reduction seems unlikely because factors other than price significantly influence the decision of allocating revenue. A detailed discussion of these factors and their effects is contained in Chapter V. There have been suggestions that the most recent round of price cuts by the vendors may be due to the impending recompetition (Masud and Power, 1991b, p.1).

3. Economic Price Adjustment

The Request for Proposal for the FTS2000 program requires that surveys be conducted to establish a pricing baseline. These surveys were conducted at the end of the first year to determine market and FTS2000 prices. The market survey is conducted by noting the average price for a 5-minute station-to-station call during a normal business day using publicly available prices. Note that this is only a comparison of switched voice rates. The survey includes 50 city pairs.

Publicly available prices are prices that can be obtained from readily available public documents such as Federal and State tariffs and other carrier-supplied documents which are not proprietary to a carrier and/or its customers.

(RFP, 1988, p.H.18)

For the purposes of the economic price adjustment, the average price per minute is calculated and this becomes the market baseline price. A similar procedure is conducted for FTS2000 prices, which becomes the FTS2000 baseline price. These surveys are repeated at the end of the fourth year. (RFP, 1988, p.H.18) If there is a greater than 10 percent decrease in the fourth year market price compared to baseline, then a comparison with FTS2000 price performance is performed. The government shall be granted a general price decrease equal to 50 percent of the difference between the FTS2000 percent decrease and the market percent decrease. (RFP, 1988, p.H.19)

An example follows to clarify this provision. Assume baseline year aggregate prices of \$.10 per minute for the market, and \$.15 per minute for FTS2000 Network B. After four years, the market aggregate becomes \$.08/min (a 20% decrease) and the FTS2000 Network B aggregate price becomes \$.135/min (a 10% decrease). The

government would be entitled to an additional 5 percent decrease on Network B prices, which would bring the Net B aggregate price down to \$.1275/min. As this example shows, economic price reduction provides no incentive to the contractor to reduce prices. Also, since the prices were measured at the end of the first year, the contractors had large disincentives not to make price reductions until after the baseline surveys were conducted. The higher their baseline prices the more credit they get for subsequent year price reductions. It would be possible for the gap between market prices and FTS2000 prices to actually grow under this proposal. The same procedure also applies to the end of year seven, with the year four survey acting as the new baseline (RFP, 1988, p.H.19).

4. Comparing Prices

Attempts to compare FTS2000 to commercial prices inevitably lead to controversy. Regardless of the conclusions, some group will not like the results of the comparison and complain about flawed methodology. However, to enforce the PAP cap provision GSA must make such comparisons periodically. The process is difficult because FTS2000 services are not identical to commercial contracts, as mentioned previously. Differences between commercial and FTS2000 methods of pricing calls also makes comparison difficult. To determine the vendor's price for a call, the FTS2000 contractor adds charges for originating access, network transport, terminating access, and features used. Then the contractor factors in applicable volume discounts to determine the price to charge the government (Moore, 1991, p.14). A comparison of prices must take into account possibly differing access charges between FTS2000 and commercial contracts, and also ensure that the services offered are "comparable" (Garbin, 1991a).

GSA hired the MITRE corporation to conduct such studies for cost comparison purposes (Garbin, 1991a). In May 1991, MITRE presented results of its studies of Dedicated Transmission Service (DTS) at an Interagency Management Council meeting (IMC, 1991a, p.2). Note that DTS is just one among six pricing schemes offered under FTS2000. Summaries of the results are provided in Figures 3 through 6.

Some assurance about the validity of the methodology used is important, because such comparisons always invite attacks. Pricing comparisons were conducted both on a transport-only basis and a total cost basis. 200 city pairs were selected, representative of circuits in the FTS2000 inventory. Prices were compared to the public service that provided the best discounted price for the large volume user. Other assumptions included: interstate rates applied and a five year commitment for at least \$1 million in charges per month was assumed (Garbin, 1991b, pp.3-5). Comparisons to US Sprint's Net B are not included. In general, Net B prices exceed Net A prices for the same service (Garbin, 1991b, pp.15-18).

The survey results presented in figures 3 through 6 are the only ones which GSA has made public. Because of the continuing controversy surrounding the program, GSA has not released specific price comparisons for services other than DTS. A GSA official has cited the need to protect sensitive proprietary information as the primary reason for not releasing data on more price comparisons (Brignull, 1991, p.1).

Results Summary (Monthly Charges)

Ckt type	Net A	Difference	Avg Commcl
T1	\$4968	+18%	\$4203
56 kbps	\$1376	+43%	\$ 962
9.6 kbps	\$ 815	+ 7%	\$ 763
Analog	\$ 657	- 1%	\$ 663

- FTS2000 prices are contract prices as of May 1991
- Prices are average monthly price per circuit

Source: Garbin, 1991b, p.8 (Based on MITRE study)

Figure 3 FTS2000 Net A vs Average Commercial Rates (DTS)

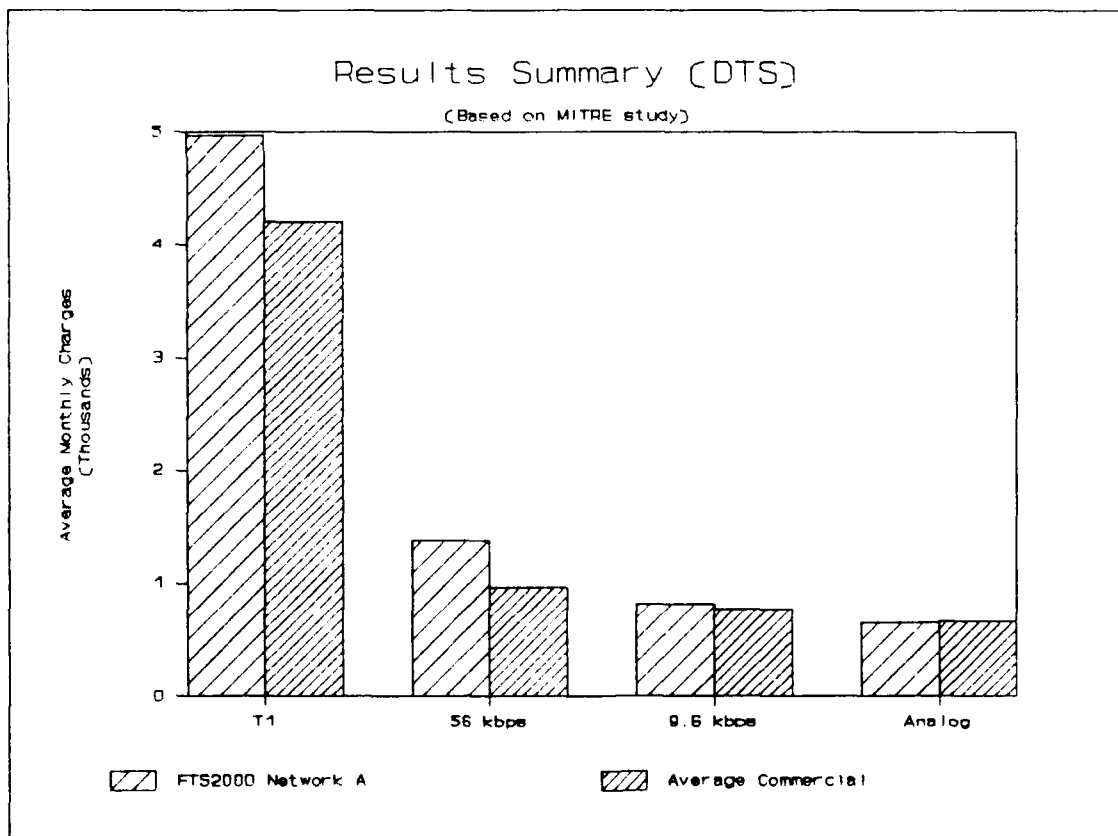


Figure 4 FTS2000 Net A vs. Average Commercial Rates (DTS)

Results Summary (Monthly Charges) - Transport Only

Ckt type	Net A	Difference	Avg Commcl
T1	\$3846	+49%	\$2584
56 kbps	\$ 613	+69%	\$ 363
9.6 kbps	\$ 273	-21%	\$ 344
Analog	\$ 443	+24%	\$ 357

- FTS2000 prices are contract prices as of May 1991
- Prices are average monthly transport price per circuit

Source: Garbin, 1991b, p.10 (Based on MITRE study)

Figure 5 DTS Price Comparison (Transport Only)

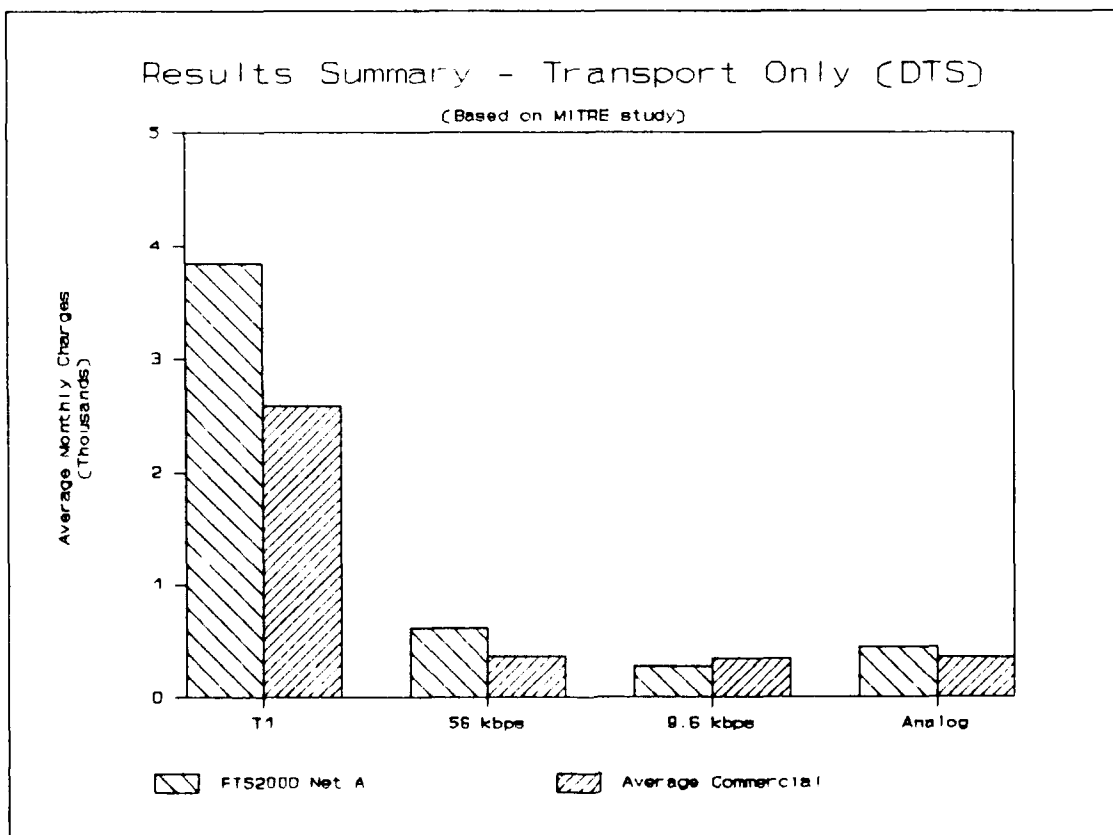


Figure 6 DTS Price Comparison - Transport Charges Only

As this example shows, it is difficult to answer the question: "Are FTS2000 prices above commercially available prices?" This question is at the heart of Congressional and agency complaints about FTS2000 and needs careful analysis. Subsequent MITRE studies used the same methodology to make comparisons to commercially available prices (Garbin, 1991a). These subsequent MITRE studies became the basis of GAO reports that were critical of FTS2000 pricing. GAO claimed that the government would pay \$148 million above commercial rates for switched voice service in fiscal years 1991 and 1992 (GAO, 1991b, p.1).

An independent comparison of rates conducted by MBG Associates tended to support the MITRE findings. The MBG analysis found that five out of seven of AT&T's largest Tariff 12 commercial customers were paying an average of 3 to 18 percent below FTS2000 rates for voice service. The remaining two customers were paying between 9 and 30 percent higher than FTS2000. (Masud, 1991b, p.73) However, Michael Corrigan has always stressed that Tariff 12 is not directly comparable to FTS2000's Tariff 16 (Strauss, 1991, p.24). The differences he stressed include automatic number identification, level of billing detail, and the future introduction of ISDN into FTS2000 (Strauss, 1991, p.24).

In addition to the GAO and MITRE studies, there is a wealth of anecdotal evidence which suggests that FTS2000 prices have not fallen as fast as commercial prices. A number of federal agencies have expressed concern about the higher costs they would incur from using FTS2000 services (GAO, 1991a, p.9). Also, numerous articles in trade newspapers voice the frustration of federal agency users concerning FTS2000 prices.

Some examples follow. When the Pentagon had to migrate voice services from an existing MCI contract to FTS2000 in September 1991, a DoD spokesman said that FTS2000 prices were 20% higher than the existing MCI contract (Taff, 1991a, p.18). The Department of Defense pegged its total costs as \$40-\$70 million higher due to participation in FTS2000 (Grimes, 1991). When the U.S. Geological Survey shifted its packet switched services from BT Tymnet to FTS2000, it found that it would spend \$5.37 million per year vs. \$2.63 million per year for the old system (Masud, 1991c, pp.3,69).

5. Falling Prices

When defending the FTS2000 program, both GSA and the two vendors state that prices have been reduced several times. Between the time the network began operation and the end of fiscal year 1991, US Sprint had cut its prices 12 times on various services (Masud and Power, 1991a, p.1). AT&T has also announced various rate cuts. For example, price reductions were announced in September 1991 for various DTS services: T-1 circuit rates were cut by 10% and 56 kbps rates by 34% (Masud and Power, 1991a, p.1). However, some of the price cuts merely reflect volume discounts. In its initial FTS2000 solicitation, GSA estimated that the total voice traffic would equal 47 million minutes per month (Masud, 1991d, p.73). However, voice traffic was 77 million minutes per month as of January 1991 on Network B, and greater than 65 million minutes per month on Network A (Masud, 1991d, p.73). The contract calls for price reductions when certain volume levels are achieved (*EDGE*, 1990, p.25). For instance, in December 1990, US Sprint announced price reductions of about 10% for switched voice service based on larger than expected volume (*EDGE*, 1990, p.25). Total annual revenue was

projected at \$350 million by the end of 1991 (Strauss, 1991, p.24). While this exceeded GSA's projections, it is far less than the widely quoted "consensus" figure of \$25 billion over a ten year period.

However, commercial prices have fallen even more dramatically. When the contracts were awarded, both vendors FTS2000 rates for switched voice service were very close to the average commercial rates. However, in mid-1989, even before any agencies had moved their traffic onto FTS2000, the average commercial rate for switched voice dropped by nearly 35%. As a result, FTS2000 prices for switched voice were between 20 and 50 percent higher than the average commercial rate when billing started. (GAO, 1991b, p.2)

C. GSA PRICING

Agency complaints about high FTS2000 pricing are not directed solely at vendors. As of 1991, GSA charged users an additional ten percent network management fee. Until August 1991, GSA also used price levelization to equalize prices between the networks. Users on Network A were charged an additional fee and a fee was subtracted from Network B users. Although levelization was discontinued, it was a very contentious issue.

1. GSA Management Fee

The GSA management fee was 15% in fiscal year 1990, and was reduced to 10% for fiscal year 1991 (Corrigan, 1991, p.2). GSA has promised users to continue to reduce its fee as network volume increases (Corrigan, 1991, p.2). Some of the larger agencies, notably the Department of Defense, were very unhappy paying GSA a fee to

manage this contract. DoD contended that it had more contract experience than GSA and already had a staff of contract experts at its Defense Commercial Communications Office (DECCO). DoD believes that these experts could manage a large commercial contract far better than could GSA (Grimes, 1991). GSA argued that it had no budget authority itself for the FTS2000 contract, and so had to obtain funds to manage the contract from the user agencies (Corrigan, 1991, p.2). However, when asked by the Interagency Management Council (IMC) for an audit of its management fee, GSA responded that its own Inspector General (IG) unit lacked the expertise to conduct such an audit (IMC, 1991b, p.3). As of December 1991, no such audit had been completed.

2. Price Levelization

GSA instituted price levelization to avoid unfairness to user agencies arbitrarily assigned to the higher priced Net B (IMC, 1990, p. 6). Initially, Network A agencies paid an additional 21% charge, which was reduced to 14.5% for fiscal year 1991 (Moore, 1991, p.15). In June 1990, GSA made the decision to waive the levelization fee for non-mandatory users if they decided to join FTS2000 (IMC, 1990, p.6). The rationale was to make FTS2000 more attractive for non-mandatory users. These users would increase the volume on the network and reduce unit costs to all users (IMC, 1990, p.6). It was this practice which drew the criticism of Senator Glenn. However, GSA had projected a reduction of the levelization factor to less than 8% due to additional volume generated by non-mandatory users (IMC, 1990, p.7). Network A agencies complained about price levelization in many forums until its elimination in August 1991.

3. Effects

GSA management and levelization fees were identified by users of Network A as the second most important billing issue (Dolezal, 1991, pp. 3,5). The effect of the additional fees charged by GSA were to slow the shift to FTS2000 and cause complaints from user agencies, even when FTS2000 was a good deal for the government. For example, when the Army started shifting to FTS2000 it was paying an average of 12.6 cents per minute for switched voice service. AT&T was charging 11.8 cents per minute for Net A switched voice. Levelization brought the charge to 13.5 cents per minute. The final cost was 14.9 cents per minute after adding GSA overhead. (Masud, 1991e, p.3)

D. SUMMARY

There is a widespread perception that FTS2000 prices have not fallen as fast as comparable commercial prices, despite administrative procedures to assure commercial comparability. The effectiveness of administrative procedures to obtain comparable commercial prices is questionable. In their defense, GSA and the vendors have pointed to the excellent level of service as well as the additional services provided by the FTS2000 program. The next chapter reviews the issues surrounding FTS2000 services.

IV. FTS2000 SERVICES

Most press articles concerning FTS2000 describe the quality of service provided to the agencies as good. However, a number of specific service related complaints have arisen. Some of the complaints, such as network interoperability, stem from the two vendor approach to the contract. Others, such as persistent billing problems, are due to difficulties in implementing new technologies. Further, the introduction of new technologies outside the original scope of the contract has created a dilemma for GSA managers in deciding if and how to incorporate new capabilities. Additionally, the "unique services" which the vendors say increase the price of FTS2000 must be examined. Finally, an overview of the extent to which user agencies are satisfied puts these issues in perspective.

A. BILLING, ANI AND ISDN

A major reason cited for replacing the old FTS was to provide better billing information to federal agencies. In the old system, billing was based on mileage and number of terminations onto the backbone. The billing system simply added up total costs and divide this figure by the number of calls (Hills, 1987, p.13). The situation has improved with FTS2000 but station-level detail records are not always provided. This has been a source of user complaints. Station-level detail records allow the user agency to correlate each call with the originating telephone number. As of January 1991, FTS2000

bills did not include the destination city and state, nor the cost of each call (Schwartz, 1991, p.21). GSA promised to add that information by April 1991 (Schwartz, 1991, p.21). This was subsequently accomplished.

Further background is necessary to understanding the issues surrounding station-level detail records. Over half of the long distance telephone traffic from government agencies comes from "consolidated locations" (Scott, 1992). Typically, these are office buildings rented or owned by GSA for use by several agencies. Telephone services may be provided by either a Centrex or a Private Branch Exchange (PBX) owned or leased by GSA (Scott, 1992). There are about 350 such consolidated locations managed by GSA in the United States (DeWitt, 1992). By early 1992, all of the centrexes will provide both Automatic Number Identification (ANI) and Integrated Services Digital Network (ISDN) capability (DeWitt, 1992). Both ANI and ISDN can support station-level detail records (Scott, 1992).

However, most PBXs used by GSA do not support ANI. Most of the PBXs provided by GSA at consolidated locations are attached to both Networks A and B, because multiple agencies are served (Scott, 1992). In the absence of ANI at these PBXs, the ISDN signalling function can be used to provide the information required for station-level detail records (Masud, 1991f, p.27). However, AT&T and US Sprint do not use compatible technical specifications to provide ISDN services. US Sprint uses Northern Telecom (NTI) DMS-250 switches for its portion of the FTS2000 network (Masud, 1991g, p.4). US Sprint has successfully supplied ISDN services from DMS-250 switches to Northern Telecom SL-1 and SL-100 PBXs at consolidated locations (Masud, 1991g).

p.4). However, ISDN interconnection from DMS-250 switches to AT&T System 85 PBXs requires an upgrade to the AT&T PBXs (Masud, 1991g, p.4). The result of these difficulties was to delay testing of ISDN service delivery (DeWitt, 1992).

ISDN's primary purpose is not providing station-level detail records. However, ISDN was seen as the solution to that issue because GSA is committed to providing ISDN through FTS2000 to all agencies who require it (Masud, 1991f, p.27). Providing ISDN at consolidated locations was seen as a step towards that goal. The cost of reconfiguring System 85 PBXs for ISDN compatibility with both protocols was estimated at \$60,000 per switch (Miller.R., 1992). GSA decided that conversions to allow compatibility with vendor's standards should proceed on a case-by-case basis (DeWitt, 1992). In other words, the decision to upgrade a particular PBX is a business decision to be made by the site GSA manager (DeWitt, 1992). It is not known what compatibility problems might be present with PBXs from vendors other than AT&T and NTI. However, Mitel is the only other major digital PBX vendor whose ISDN implementation is incompatible with AT&T's 5ESS switch. GSA could not give a breakdown of its PBXs by vendor or state whether most of its PBXs were purchased from major manufacturers.

Until station-level detail records are available, billing to agencies at consolidated locations is done by call sampling. In this method, 10% of the call detail record supplied by the vendor is compared to the call detail record of the PBX and an apportionment of costs is made on that basis (Barrow, 1991). This method has not proved satisfactory to agency telecommunications managers and was the highest priority billing issue at the Network A Users' Forum of July, 1991 (Dolezal, 1991, pp.3,4).

B. INTEROPERABILITY OF SERVICE

1. Switched Voice Services

The difficulty of providing station-level detail records highlights the issue of network interoperability. The Request for Proposals did not contain any requirement that the two networks be interoperable (Cleveland, 1991). However, GSA is committed to providing full interoperability between the networks as the system evolves (Cleveland, 1991). Many of the GSA and military personnel interviewed for this thesis complained about the interoperability issue. They laid the blame with Congress for forcing GSA to award the contract to two vendors, rather than relying on the single vendor approach originally proposed. However, such a view is mistaken, as will be discussed later, interoperability is largely a contractual, rather than technical, matter.

One disadvantage of having two networks is the increased cost of "off-net" calls. About 60% of the FTS2000 voice traffic is "off-net" (Craddock, 1991). Much of that traffic originates from government offices but terminates at private lines. Examples might include a Navy project management office calling a contractor or a Social Security Administration official returning a pensioners' call (Scott, 1991). (Such calls would be off-net with a one vendor system as well.) When such calls terminate in a Local Access and Transport Area (LATA) with an FTS2000 point of presence, then the long distance portion of the call is transported on FTS2000, theoretically saving money over the direct dial charge (Scott, 1992).

However, it is off-net switched voice traffic between Networks A and B which highlights the problem with separate networks. Unfortunately, a large portion of off-net

traffic consists of this second type of call (Craddock, 1991). Because the two Networks are physically separate, such calls incur additional access and termination charges to cross between networks (Craddock, 1991). As of this writing, GSA was working with the two vendors to provide interoperability for switched voice, but disputes over billing and costs of gateways were stalling the negotiations (see below).

While off-net calls between the two networks can be relatively expensive, they will be completed. That is not true for some other services provided by FTS2000. Video transmission, packet switched services, and electronic mail (e-mail) are examples of services which are not interoperable.

2. Other Services

As of this writing GSA was working with the vendors to provide interoperability between the networks for switched voice, switched data services, packet switching services, and compressed video transmission services. The reasons for the lack of interoperability between the networks are sometimes technical but always include contractual issues. In this regard, the original Request for Proposals only stated that:

"The government shall develop with its FTS2000 contractors following contract award, plans and schedules for implementing interoperability capabilities between FTS2000 networks and services." (RFP, 1988, p.C-18)

Given the short time that GSA had to modify the RFP from a one vendor to a two vendor award, it is not surprising that the issue of interoperability was deferred until after the FTS2000 was established.

Some of the contractual problems making it difficult to provide interoperable services include:

- A method of verifying billing is not available. This is required because separate transport charges need to be billed for each network's traffic to and from a gateway.
- The vendors and GSA have not agreed upon how to assign responsibility for troubleshooting problems with cross-net traffic.
- The vendors do not agree with GSA's projections of cross-net traffic and are therefor unwilling to amortize the cost of gateways based upon those projections.

GSA is closer to providing gateways between Network A and certain Department of Defense networks than it is to providing gateways between Network A and Network B. For example, a gateway to provide compressed video transmission from Network A to the Defense Commercial Telecommunications Network (DCTN) was described as near a term possibility. (Curry, 1992)

3. Electronic Mail

Electronic mail is a feature available as part of either switched voice services or packet switched services (AT&T, 1991, p.7-1). FTS2000 e-mail complies with the X.400 addressing protocols (AT&T, 1991, p.7-1). In June 1991, National Institute of Standards and Technology (NIST) officials announced a gateway which would connect FTS2000 e-mail users with the Internet (Masud, 1991h, p.1). Such a connection would allow e-mail to pass between government agencies and such networks as the Defense Data Network or the BITNET. However, Network A e-mail customers cannot communicate with Network B due to contractual difficulties (Masud, 1991h, p.1). Government agencies with proprietary e-mail systems can link their existing systems to FTS2000 e-mail by purchasing an X.400 gateway (Masud, 1991h, p.73). However, the NIST gateway is not currently available to all Network A users.

4. Videoconferencing

Currently, the two networks' compressed videoconferencing services are not completely compatible across networks. Network A features a 384kbps system which has also been used in the Defense Commercial Telecommunications Network (DCTN) (AT&T, 1991, p.8-1). US Sprint's Net B offers a 768kbps videoconferencing capability. However, one vendor of videoconferencing equipment, Compression Labs, Inc. (CLI), manufactures video-coder-decoders which can operate at both data rates. CLI has been a partner with AT&T in providing videoconferencing technology for Network A users (Kakaviatos, 1991, p.8). As mentioned previously, GSA has not resolved the contractual issues required to obtain interoperability of the two video systems.

FTS2000 only provides transport services for agencies needing videoconferencing. Providing a conference facility has been the responsibility of the requesting agency. Because agencies lack experience in this area, there has been reluctance to experiment with videoconferencing. User agencies asked GSA for help in setting up "turn-key" facilities (Dolezal, 1991, p.31). GSA responded by setting up a pilot project in July. This allows agencies to try out videoconferencing at GSA provided facilities (Kakaviatos, 1991, p.6).

C. NEW TECHNOLOGIES

Videoconferencing is just one example of a new technology that is pushing the limits of the FTS2000 contract. Although FTS2000 was designed as a state of the art system in 1988, continued advances in telecommunications have outpaced the require-

ments of the contract. Also, the local exchange carriers that provide much of the access to FTS2000 are a source of dissatisfaction to user agencies, in part because they lack the latest technical offerings.

1. Local Exchange Carriers (LECs)

Local exchange carriers (LECs) have been a source of various problems for FTS2000 user agencies, much as they have been for large business users. In many rural areas, LECs are not able to provide the digital access needed to use FTS2000 services other than switched voice. Further, LECs are unwilling or unable to provide alternate routing for agencies who have procured dedicated transmission service (DTS) and packet switched services (PSS) for reasons of reliability (Dolezal, 1991, p.23). Problems with local carriers have led to inefficiencies, such as leasing multiple 9.6kbps lines rather than single 56kbps lines (Messmer, 1991b, p.59). To resolve this difficulty, GSA started contract modification talks with the two vendors (Messmer, 1991b, p.2). The contract would be modified to have AT&T and US Sprint obtain the needed digital access from the LECs (Messmer, 1991b, p.2).

2. ISDN

Even where the LECs can provide digital access, end to end connectivity of digital service is not assured. A case in point is ISDN. As discussed previously, compatibility of technical standards has slowed GSA's pilot testing of ISDN services. Use of ISDN standards means that, theoretically, equipment made to the standards should work with a telecommunications system that is following the guidelines (Seideman, 1990,

p.49). However, this has not been the case in practice. GSA originally planned for to provide ISDN services through FTS2000 by 1991 (Seideman, 1990, p.48). As of January 1992, pilot testing of ISDN services was still in progress. The following services have been demonstrated successfully using ISDN: switched voice, switched data, and switched video services (DeWitt, 1992).

3. Frame Relay Services

Another digital protocol, which may compete with ISDN for some applications, is frame relay technology. Frame Relay is a stripped down form of X.25 packet switching, which promises to deliver much higher throughput over the same medium. Even though frame relay protocols are not yet in wide spread use, some government agencies are interested in obtaining frame relay services. Agency telecommunications managers feel that their data communications bandwidth requirements are going to grow rapidly in the coming decade and see frame relay systems as a solution to providing that bandwidth. Agency managers have made early requests for this new technology, because, in their opinion, contract modifications take entirely too long. (Dolezal, 1991, p.22) As of this writing, US Sprint was working to provide frame relay services on Network B; AT&T had not announced such services for Network A (Masud, 1991i, p.34).

D. UNIQUE SERVICES

The FTS2000 program provides certain unique services not available under normal commercial contracts. However sorting out the claims of vendors concerning just what

is truly unique is a difficult task. This has become an issue because of vendor claims that these services and requirements cause the cost of the FTS2000 contract to exceed comparable commercial prices. Figures 7 and 8 detail the unique services or contractual provisions which US Sprint and AT&T claim cause FTS2000 to cost more than comparable commercial contracts. GSA officials believe that many of the services detailed in figures 7 and 8 are not unique; such as maintenance, network control, program management and user troubleshooting (GAO, 1991b, p.5). Other features are clearly unique; such as National Security Emergency Preparedness requirements (GAO, 1991, p.5). However, neither GSA nor GAO has been able to evaluate the incremental costs associated with clearly unique requirements (GAO, 1991, p.5).

E. CUSTOMER RELATIONS

Dissatisfaction with the services provided by FTS2000 have not been nearly as damaging as the pricing and contract management issues discussed in the previous chapters. Still, they are important to GSA's customers, the federal user agencies. The overall attitude of agencies towards the program is generally good. However, users decry what they see as a "Request for Proposals mentality" on the part of both vendors (Sweeney, 1991, p.6). On Network A, users have been unhappy with AT&T's service response time. Network A users feel that the 30 to 40 days AT&T typically takes to initiate service is excessive, especially where service is to be provided through an already connected Centrex (Dolezal, 1991, pp.6,7). On Network B, users have been unhappy with US Sprint's unwillingness to make minor contract modifications to enhance the value of

Additional FTS2000 Requirements - US Sprint

Network translation

Service delivery points grade of service

Single-line sets

Multi-line key telephone systems

Private branch exchange

Centrexes

Data circuit--terminating equipment

Grade of service requirements

Customer service administration

Service orders

User troubles

User trouble reporting

Trouble handling

Trouble report data access

Credit adjustments

User complaints

Entering/handling complaints

User feedback

User complaint data access

Government training

Executive

General user

Agency administration and operations

Service Oversight Center administration and operations

Supplemental training

User assistance

Billing system

Shared-location billing

Billing system verification

Ordering process new/expanded services

Monthly billing process

Billing data retention

Network operations and management

Transition and cutover management

72 hour acceptance testing

Figure 7

Additional FTS2000 Requirements - AT&T

One time minimum (\$270 million)

Indefinite delivery, indefinite quantity contract

10-year pricing

Usage-based services

Fixed access rates

Scheduled decreases

Can never increase pricing

Six major services in one contract

Executive Program Board

Dedicated features

Network management center

Service request and status

Provisioning

Maintenance

Billing

Account inquiry

Systems and data center

Marketing to agencies

"In line" management of principal processes

Government access to systems

Attendant services

Service planning department

Detailed test and acceptance plans

Technical Advisory Center

Training

Service analysis tool for users

Bell Labs Office of Chief Technologist

Service Oversight Center (Network Software)

Technological refreshment (standards & features)

National Security Emergency Preparedness

Hardened relocation site

Dedicated network backbone to support insularity

Internal contract competition (years 4 & 7)

Source: GAO, 1991b, pp 15-16

Figure 8

the network to its users (Sweeney, 1991, p.6).

For its part, GSA has made efforts to improve its relations with the agencies. The year 1991 saw the first meetings of Network A and Network B users forums. Further, a group called the Interagency Management Council (IMC) has performed the functions of an executive steering committee for FTS2000 since the contract inception. The IMC members are the top information resources management policy makers at the major government agencies. In addition to acting as a steering committee, GSA has used the forum to disseminate useful information and help agencies manage their participation in FTS2000. For example, GSA has highlighted the cost savings of implementing switched digital integrated services (SDIS) (IMC, 1991a). (SDIS multiplexes low speed data and voice communications onto a T-1 circuit.) Unfortunately, GSA has not always been able to place full management emphasis on its relations with the agencies. On more than one occasion, GSA officials have felt it necessary to delay responses to IMC agenda items to respond to Congressional investigations. The swirl of controversy that has surrounded FTS2000 has affected the ability of the U.S. General Services Administration to manage the program. In the next chapter, the underlying reasons for GSA's difficulties in managing the program will be examined.

V. LEARNING FROM FTS2000

The historic, political, and economic roots of the controversy surrounding FTS2000 have a silver lining: the opportunity to learn from the results of that experience. This chapter analyzes what GSA has learned from its experience with FTS2000 and what additional lessons can be learned from the contract pricing structure and service delivery. As such, the failure of administrative pricing mechanisms must be examined in detail. Further, the manner in which pricing and service delivery are intertwined is also analyzed, along with the vendor claims in this regard. The purpose of such an examination is to sort out what services are really driving costs, if any; and if such cost-drivers might be marginally priced. Finally, an alternate set incentives for the program is analyzed to predict how new incentives might change participant behavior. Additionally, an appropriate way to sell such reforms to the Congress is discussed.

A. GSA: LEARNING BY DOING

When GSA submitted its final Request for Proposals in 1988, its experience at managing a large telecommunications services contract was limited. AT&T had provided end-to-end management of the FTS, limiting GSA's need for detailed involvement. FTS2000 presented a level of complexity far exceeding the FTS. FTS2000 combines a variety of service offerings, some of them are on the leading edge of technological development. So it might be expected that GSA would have growing pains with the

program. GSA Information Resources Management Service (IRMS) personnel seem to already be gaining competency from their experience in managing FTS2000.

Perhaps the most important lessons for GSA have come out of their dealings with Congress. Despite the fact that Congress' fingerprints were all over the FTS2000 system design, for a long time GSA remained uncommonly unresponsive to Congressional input concerning FTS2000. One example was the prolonged refusal to shift the Navy back to AT&T. The year 1991 was especially replete with examples of GSA failing to please its Congressional critics. However, as discussed in Chapter II, the appointment of Don Scott (as Associate Administrator for FTS2000) coincided with a series of moves which greatly mitigated the severity of Congressional criticism. The obvious lesson for any federal agency is that Congress is a stakeholder which agencies ignore at their peril.

GSA's relations with the other stakeholders in FTS2000 have been difficult as well. The secret negotiations with US Sprint (for the Navy revenue) caused a considerable loss of credibility with AT&T. AT&T's decision to appeal GSA's action to the Board of Contract Appeals was almost unprecedented (Taff, 1991b, p.9). It revealed the depth of AT&T's displeasure with GSA's management. The action ultimately left bad feelings at US Sprint as well. The genuine bitterness felt at US Sprint after the loss of the Navy business was surprising. For their part, the vendors have not always been very responsive to the needs of the federal agencies. In part, this lack of responsiveness seems to stem from the structure of the contract, which will be discussed later.

The federal agencies served by GSA are the least dissatisfied group. With the exception of the Department of Defense, which is not a full participant in FTS2000, most

agencies have felt that the service received could be rated as good. The establishment of the Interagency Management Council to act as an executive steering committee for the program appears to have helped maintain good relations with the agencies. GSA is to be commended for their foresight in the establishing this council. However, GSA has not always been responsive to the issues raised at IMC meetings. A review of IMC minutes gave the impression that GSA had great difficulty keeping up with agency requests and complaints as expressed at IMC meetings. Often GSA seemed distracted by having to continually respond to Congressional inquiries. Hopefully, with less Congressional intervention in the future, GSA can spend more time responding to agency requests.

One IMC agenda item that GSA never answered was a request for an audit of its management fee. GSA responded that its Inspector General unit lacked the expertise to conduct this audit. Their answer casts doubt about the fairness of its 10% fee. The fee seems particularly excessive when compared to that charged by the Defense Commercial Communications Office (DECCO). DECCO charges a fee of about 1.5% for managing a range of contracts similar in scope and variety to FTS2000 (Miller,D., 1992). In the pricing of telecommunications services, this ten percent is significant. Thoroughly reviewing its management fee would gain GSA credibility and respect from the user agencies.

B. THE LACK OF CONTRACT PRICING INCENTIVES

Although GSA's management fee has attracted the attention of the user agencies, it is vendor pricing that has drawn Congressional complaints. This has occurred in spite

of several administrative measures designed to hold down prices. However, an analysis of the pricing mechanisms show that the vendors have little incentive to reduce price. Chapter III detailed the lack of incentives in the economic price adjustment clause; this section will focus on the deficiencies of the price redetermination and PAP cap provisions of the Request for Proposals.

1. Price Redetermination

The threat of revenue re-allocation (price redetermination) is seen as the government's primary tool for obtaining the lowest possible prices on FTS2000. However, the structure of the recompetition casts doubt upon its effectiveness. First, FTS2000 revenue shares will not be allocated to any third party. Second, there are reasons to believe that the revenue re-allocation will not be significant. Mr. Don Scott announced that GSA will evaluate bids for recompetition on the basis of price and quality of service equally (Masud, 1991j, p.28). Due to its higher costs, US Sprint will most likely have higher prices. However, in the area of service, US Sprint has a clear advantage over AT&T. It has been far more aggressive than AT&T in educating agencies about its service offerings and has been more responsive than AT&T in responding to orders for new services. Given the equal emphasis on price and service, AT&T's price advantage would seem to cancel US Sprint's service advantage, leaving revenue award unchanged.

The reallocation of revenue share would also impose a burden on the government. Shifting agencies between vendors would be a great inconvenience to the government. This burden is explicitly mentioned in the Request for Proposals as a factor in determining the extent of revenue re-allocation. Finally, US Sprint will likely have the

higher prices, but a reduction of US Sprint's share would not save the government as much money as expected. With a reduced number of agencies, the volume discounts that US Sprint currently gives the government will be reduced, adversely affecting FTS2000 prices. These factors likely equality in the recompetition, burden to the government of re-allocation, and desirability of maintaining US Sprint's share of the contract, mitigate recompetition's impact on prices.

However, there is evidence that the approaching recompetition has put the vendors on better behavior with regard to price. For instance, both vendors announced price cuts in the second half of 1991. However, conditions in the industry as a whole seem to be working fortuitously for them as well. The trend of deep price cutting on long distance service seems to have abated for the moment (Garreis, 1991, p.1). The recently announced cuts will bring FTS2000 prices more closely in line with commercial prices heading into recompetition. Dramatic commercial price cuts immediately after the recompetition would create an extremely unfavorable comparison, which would be very embarrassing for top GSA management. Fortunately, recent trends in prices make that unlikely. Congressional leaders have indicated that they will review the recompetition closely for evidence that GSA is obtaining the best available price for FTS2000 services (Bass, 1991c, p.1). A different interpretation of the latest round of price cuts is that the vendors do not wish to generate animosity on Capitol Hill.

More importantly, these recent price cuts do not prove that the long term problem is solved. The real problem with FTS2000 prices has not been their absolute level, but the manner in which they lagged cuts in the commercial marketplace. With a

price redetermination scheduled for 1992 and 1995 and the contract ending in 1998, price redetermination only acts as incentive every three years. Based on the historical evidence, recompetition every three years does not cause the vendors to keep pace with commercial price reductions. In the interim, GSA must rely on the PAP cap to keep prices competitive.

2. The PAP cap

Arguments that the PAP cap is not effective are best made by looking at its historical results. It was the failed PAP cap enforcement against US Sprint which started GSA down the slippery rope of negotiating revenue allocations in return for price concessions. The resulting Congressional investigation cast grave doubts on GSA's ability to manage FTS2000. In fairness, GSA would argue that the decision to negotiate rather than take punitive action was based on legal counsel that the PAP cap was unenforceable. The solution, so this reasoning goes, would be to renegotiate the contract with enforceable PAP cap language. What language in the contract made the PAP cap unenforceable is not public knowledge. Further, negotiations with the vendors have not yet yielded contract language judged enforceable.

Regardless of enforceability, the PAP cap is not desirable for other reasons. Most importantly, it creates an incentive for the vendors to violate its terms. Monitoring for violations is an arduous task for the government, which must keep track of new price offerings in the long distance market and make comparisons to FTS2000 prices. The cost of monitoring and negotiating rebates is an additional task which GSA management can ill afford. Further, vendors have an incentive to delay price reductions until they "get

caught" because there are no additional penalties for failing to reduce prices. Another incentive for the vendors to violate the PAP cap is that they might win their case on appeal or GSA might conclude that the cost of legal action will exceed the savings. This creates an unhealthy adversarial relationship between GSA and the vendors, and it does not save the government money. This also puts GSA in a terrible bind, because failure to "prosecute" PAP cap violations will be criticized by Congress.

GSA's precarious relationship with Congress is the strongest argument that the PAP cap is an unwanted pricing device. The PAP cap makes it very difficult to defend the contract to Congress. As the vendors have suggested, there are unique aspects to this contract. In some instances, GSA and the vendors are on the leading edge of technological innovation. (Testing of switched video services is one example.) The PAP cap has the subtle effect of oversimplifying the conception of the program. The PAP cap's very existence inevitably leads the Congress into questioning whether the caps is being met. For instance, the GAO chided GSA for data service prices above those commercially available, even though the PAP cap does not apply to data services (GAO, 1991b, p.3). As discussed in Chapter III, in an environment of declining prices, FTS2000 price reductions will always lag the most recent large commercial offering. Given that situation, and their history, Congressional investigators will always be able to find some example of prices above commercial rates. This will lead to undesirable tension with Congress. It is unavoidable that a fixed price contract negotiated in a climate of declining prices will be overtaken by commercial price cuts until the contract is renegotiated. What is needed instead is a contractual mechanism which will satisfy the Congress concerning price and

not invite its constant scrutiny. Such a mechanism must also insure that government obtains as low a price as could reasonably be expected. A recommendation to meet these standards that would not include PAP caps is proposed later in this chapter.

C. DELIVERING SERVICE

Operating under the PAP cap also has an impact on the delivery of new services. The PAP cap, by definition, should cause the vendors to operate FTS2000 on the smallest margins in the industry. Operating under such circumstances gives the vendors little incentive to develop new offerings for FTS2000, even if the offerings might be to the government's benefit. This will be even more true if the PAP cap is extended to all services, as is currently being considered.

The PAP cap is not the only reason for the slow delivery of new services. This failure of the vendors to deliver interoperability as well as additional new services has been ascribed in part to a "Request for Proposals" mentality. However, the contract instills such a mind-set in US Sprint and AT&T. Their only incentive to develop new services for FTS2000 is the hope that the increased traffic volume will amortize development costs. This issue is better phrased as: "Who will bear the risk of development of new FTS2000 features." It is GSA's contention that this risk should be borne entirely by the vendors. For their part, the vendors do not trust GSA's forecasts as a basis for taking the risk of developing new offerings. It seems unfair to ask the vendors to assume all development risk. Some form of risk-sharing between the government and the vendors, as is prevalent in most development contracts, would be appropriate to cut this Gordian

knot. The disadvantage of risk sharing is the need for GSA to obtain funding from Congress to bear its portion of the development burden. Given its poor relations, this might be difficult. However, a method of administering FTS2000 is proposed later in this chapter which should satisfy Congressional concerns about price and service. Risk-sharing for new development could be packaged as part of these proposed reforms.

D. SERVICES, FEATURES AND PRICING

FTS2000 service delivery has also been criticized because of the "one size fits all" nature of the system. The example of Packet Switched Service (PSS) is illustrative. Public offerings for packet switching fall into two general categories: using a public switched data network, or using a private network (IMC, 1991c, p.3). The FTS2000 PSS offering falls somewhere in between these two types of offerings in terms of both quality and price (IMC, 1991c, p.3). Agencies whose needs could be met by the public network get a relatively bad deal on price. Agencies who would have otherwise used a private network are getting a break on price for PSS. With the exception of its electronic mail features, the features provided under the PSS offering are included in the basic service price (AT&T, 1991, p.13.25).

If all service feature pricing was structured like PSS, then the "one size fits all" criticism might be valid. However, other service offerings require additional charges for the use of additional features. For example, agencies pay for features of SVS, such as call screening or audio-conferencing, only if ordered (AT&T, 1991, pp.13.14-13.23). (See Appendix A for a more complete description of feature pricing.) This concept of marginal

pricing for service features extends to the other service offerings as well. This makes sense because it allocates the cost of additional service to the agency receiving the benefits.

Because these features are paid for only when used or ordered, it would not be expected that their mere existence would increase the cost of basic services. However, in criticizing MCI's Government Telecommunications Service (GTS) offering, the lack of additional features was cited by US Sprint as a reason why MCI could offer a lower tariff (*Edge*, 1991b, p.5). It is unlikely that feature availability is a key issue in driving up the cost of FTS2000 for two reasons. First, the features are paid for when used, which means that they should not affect the price of basic service. Second, the features are available because of the advanced switching equipment used by all three major long distance carriers. As such, the availability of these services is not a factor unique to FTS2000, which would drive costs above comparable commercial prices.

US Sprint also cited other factors to demonstrate FTS2000's superiority over GTS. These included: network and account management, advanced billing features and call detail, guaranteed grade of service, and a nationwide ubiquitous network (*Edge*, 1991b, p.5). Comparing FTS2000 to GTS was dismissed as an "apples to spam" comparison (*Edge*, 1991b, p.5). The importance US Sprint's comments lies not in whether FTS2000 is superior to GTS, but rather in what they reveal about the sources of costs in the FTS2000 program. For purposes of analysis, the features which drive costs can be divided into three classes:

- Services which are truly unique and whose existence is network wide, offering no opportunity for marginal pricing.
- Services which are truly unique, but which could be supplied under a separate billing arrangement.
- Services which do not fundamentally differ from other large telecommunications offerings.

In the first category, the following service areas are truly unique, cannot be priced separately, and contribute to additional costs to the program:

- National Emergency Security Preparedness (NSEP) requirements for hardened relocation sites.
- Dedicated Network management functions, although the exact value and cost for this function is beyond GSA's ability to even estimate.
- Guaranteed Grade of Service for Switched Voice Service and dial-up Packet Switched Services.

Additionally, when Integrated Services Digital Network (ISDN) capability is fully implemented on the network, this feature will make FTS2000 unique from large commercial offerings under Tariff 12 (Strauss, 1991, p.24). These features' costs cannot be separated from the costs associated with the basic services. However, the FTS2000 contract currently has no mechanism to review the appropriateness of the features. For example, the busy-hour, busy-day grade-of-service requirement is 7% (P.07) (AT&T, 1991, p.5.2). Allocating sufficient equipment to maintain this grade-of-service is a cost to the program. By how much could costs be reduced by providing 8% grade-of-service? Would the decreased service be worth the trade-off? This review is warranted because the

evidence points to a presumption that FTS2000 prices are not the best the government could obtain.

Services which fall into the second category and could be priced separately include account management, advanced billing features and call detail. These services have in common that they provide agency managers information with which they can reduce telecommunications expense. If these services were priced separately, government managers would then be able to decide if the cost savings that they could wring out of their systems with this additional information would be greater than the cost of providing this information. Further, stripping basic services of these features would make it easier for GSA managers to compare the basic service to comparable commercial contracts.

As already discussed, the mere availability of additional services is something that should not be considered a cost-driver unique to FTS2000. The costs of a nationwide ubiquitous network fall into this third category as well. Despite the vendor claims, it is not clear how ubiquity adds to FTS2000 costs. In this regard, consider the architecture of the two networks. Network A consists of 17 service nodes using 5ESS switches interconnected on a T-3 backbone network (AT&T, 1991, p.3.4). These service nodes are controlled by a distributed intelligence network consisting of network control points (NCPs), No. 2 signal transfer points (#2STPs), and signalling links (AT&T, 1991, p.3.4). The Network B architecture consists of a Virtual Private Network with dedicated management features. With the exception of the dedicated management features and National Security Emergency Preparedness (NSEP) requirements, these networks do not differ in any fundamental way from the public switched telephone network (PSTN).

Therefor the costs of an ubiquitous network should be no different from the costs of providing large commercial customers with a custom telecommunications network, such as in Tariff 12.

The need for an ubiquitous nationwide network is really a hidden assumption underlying the structure of FTS2000. The efficient operation of the government, and the need to continue operations in the event of emergencies, are arguments in favor of a unified system. However, it should be pointed out that the current system does not meet that criteria. Its two separate networks lack interoperability. Further, US Sprint has built a virtual private network which might be subject to the same physical ravages as the public switched network in time of emergency. These points stress the urgency of developing interoperability between the two networks, which has so far eluded GSA. If "ubiquity" is really a factor raising network costs, then the government has not actually received the benefits of ubiquity.

E. THE ALTERNATIVE: FREQUENT COMPETITION AND REVIEW OF COSTS

The issue of network ubiquity returns the discussion to the question of what incentives GSA should offer the vendors to solve the interoperability problems. As previously stated, some form of risk-sharing would be appropriate to obtain an agreement for the development of gateways between the two networks. This would require funding from Congress, and would best be part of a package of reforms proposed by GSA to

lower FTS2000 costs and improve service. In addition to addressing risk-sharing, reforms of the FTS2000 program should meet the following criteria:

- The government must be assured it is receiving the best possible price for the services rendered.
- The marginal benefits of unique requirements should exceed their marginal costs.
- The reforms should include a mechanism to better deliver new telecommunications services to agencies.
- The process should act to cool the high passions among the stakeholders, especially between GSA and Congress.

A contract similar to that used for the Defense Commercial Telecommunications Network (DCTN) would help address these key issues. The DCTN contract incorporates an Annual Subscriber Rate Review process which has the following key elements:

- Price renegotiation.
- Discussions to eliminate contract elements which are driving up system costs.
- Negotiations for the introduction of new services
- The option to discontinue new purchases of a particular service and to contract outside the system for those services. (Miller,D., 1992)

The option to purchase services outside the contract does not involve switching existing customers away from their current carrier. For example, at one time DECCO found DTS T-1 prices uncompetitive under the DCTN contract. They also had users who needed to obtain T-1 circuits. Rather than provide the circuits through the DCTN, DECCO put these new circuits out for competitive bid. Rather than lose this additional

business, the DCTN vendor successfully came up with the low bid for the new circuits. But now the low bid applied to the already existing T-1 circuits, which worked to the governments advantage. (Miller,D., 1992)

A complete analysis of the DCTN is outside the scope of this thesis and would be a worthwhile area for further research. However, some anecdotal evidence suggests that this contract has been a success. DCTN has not invited the same attention from Congress as FTS2000. Nor do its users seem dissatisfied with the prices obtained under the contract. In fairness, DCTN lacks FTS2000's complexity. It has only one vendor, simplifying the management task. The long history of co-operation between that vendor (AT&T) and the Department of Defense also works in the program's favor. But the key point is that it already incorporates the key elements of the proposals described for FTS2000.

The process of an annual review would address the key issues facing FTS2000. First, by reviewing prices annually, the current lag between commercial price reductions and FTS2000 price reductions would be reduced to a maximum of one year, and should average no more than six months. Further, an annual review would inject more competition into the process than the current three year gap between re-competitions. Competition is a less burdensome way for the government to assure it is receiving the best available price. Economic theory tells us that competitive bidding obtains the best price for the government. The failure of administrative mechanisms, such as the PAP cap, have been obvious.

A major criticism of this recommendation is that Congress would be required to amend the mandatory use provisions of the appropriations bills. Rep. Conyers (D-MI) has frequently stated his opposition to weakening mandatory use, and has on occasion chided GSA for not vigorously enforcing mandatory use provisions. Rep. Conyers' reasoning has been that mandatory use best ensures the economies of scale required to obtain best price. While it is true that the vendors have given the government discounts for volume of service, volume is not the sole factor driving FTS2000 prices. Changing the mandatory use rules to allow the purchase of new circuits outside FTS2000 would not affect the volume discounts already in place. Further, because FTS2000 already is carrying a large volume, the current vendors are likely to have the lowest costs and therefore be able to offer the lowest prices for new circuits. A second benefit of an annual review process would be to review the mix of options offered under FTS2000. This review could eliminate little used or too costly options that drive up the cost of FTS2000. An annual review could also be the framework for negotiating the introduction of new service offerings.

The most important benefit of an annual review process would be to reduce the adversarial nature of dealings between GSA and the vendors. Rather than applying strong arm tactics to get price reductions, GSA and the vendors could engage in a cooperative search for elements which can reduce both cost and price. Both the vendors and the agencies could share in the savings from such a process. Such a cooperative effort would go a long way towards establishing a closer partnership between GSA and its vendors. Further, the results of such savings would impress a cost-conscious Congress of GSA's

managerial expertise. The annual review should in no way weaken the current role of the Interagency Management Council. However, such a review could be used to resolve the pressing issues identified by agencies at the annual user's forums. The existence of an annual review would give the agencies a sense that a timetable existed for the resolution of their complaints.

However, the annual review is not a panacea for issues of service and price. First, unique services such as the National Security Emergency Preparedness (NSEP) requirements would still be carried by the entire contract. Secondly, service features wanted by many but not most of the agencies might still be retained, driving up the cost and therefore price of services. Hiding the cost of unique services distorts management decision making. For example, the costs of NSEP requirements are carried by the entire contract and are therefore hidden from the scrutiny of the budget process. There are good reasons for such requirements, but their costs should be explicit. In that way, a rational decision about the benefits as weighed against costs might be made. All unique service features need to be subject to this scrutiny. This will allow the FTS2000 contract itself to more easily defended by GSA and the vendors, as hidden cost drivers will be removed from the contract.

F. SELLING THE SOLUTION

Even if these suggested reforms could be implemented by GSA alone, it would not be advisable for them to attempt to do so. The long history of close Congressional involvement with FTS2000 would require GSA to sell the package of reforms to the

Congress, and specifically to the committees chaired by Rep. Conyers and Sen. Glenn. Given the animosity and strong language which has flowed from the offices of these committee chairmen, pitching a set of reforms to them would be no mean feat. However, their main interest in FTS2000 seems to be in lowering its cost to the government. Congress has a vested interest in reducing the costs of non-entitlement programs because they can cast themselves as cost-cutters, or they can use the cost savings to fund more popular programs. Proposed reforms to FTS2000 need to be framed primarily as measures which will reduce the costs to the government. Raising the cost issue is necessary because the congressman will certainly be skeptical of any proposal which weakens the mandatory use rules.

Due to recent history, GSA is probably not in a position to lobby Congress effectively on its own. Because the mandatory use legislation is part of appropriations laws and these proposed changes could save the government money, the actual proposal should probably come from the Office of Management and Budget (OMB). Further, GSA would be well advised to engage the federal agencies as allies in proposing these changes. Because the changes are similar to the way that the Department of Defense already runs the DCTN contract, DoD telecommunications specialists would make persuasive witnesses for GSA in Congressional hearings. Lastly, the active co-operation of the vendors in changing the contract would certainly be helpful. AT&T is well known for its skill in educating Congressmen on issues vital to its corporate health. However, the vendors do not have an automatic incentive to support changes in the contract. The strongest factor to enlist the vendor's support would be the reduction of the steady stream of criticism

directed at them by Congressmen and their staffers. From a public relations point of view, FTS2000 has not helped their corporate images.

If Congress approved changes to FTS2000, would it usher in the millennium? Probably not. GSA would still have a great deal of hard work to do in defining the direction of federal telecommunications services should take over the next decade. That will involve continuing to work with all of the agencies of the federal government, grappling with new technologies, and balancing the benefits of changes to FTS2000 against their costs.

VI. CONCLUSION

A. CONCLUSIONS

The previous chapter analyzed a number of issues, but none so important as the price of FTS2000 services. Regrettably, one must conclude that the price reductions of FTS2000 services have significantly lagged the price reductions of its commercial counterparts. The results have been costs to the federal government that are tens of millions of dollars in excess of expectations. While some fraction of this excess cost is due to unique requirements, they do not account for all of the increased costs. In addition to relatively higher prices from the vendors, user agencies are charged a ten percent GSA management fee, which GSA has avoided justifying. The size of this fee appears unreasonable when compared to those charged by the Defense Commercial Communications Office (DECCO) for similar services.

As regards to unique requirements, if they are truly responsible for significant additional costs, neither GSA nor the FTS2000 vendors are able to quantify how these requirements affect the cost of the contract. Guaranteed grade of service, National Security Emergency Preparedness, and dedicated network management are all examples of services adding to the costs of FTS2000. Because these services are incorporated into the structure of FTS2000, their costs are hidden from view. Further, GSA has no mechanism for weighing the marginal costs of these services against their marginal

benefits. As such, the appropriate level of these services cannot be identified. This results in a less than optimum program.

The overall quality of FTS2000 services has been described as good. In particular, the switch to FTS2000 from the old FTS was accomplished ahead of schedule resulting in significant savings. However, some aspects of service delivery are not satisfactory. For example, providing call detail records at shared locations is still not feasible. More importantly, the two networks lack interoperability. Although the two switched voice systems can be interconnected, such connections entail additional costs. Further, the resolution of interoperability is stalled due to contractual issues. This lack of interoperability has precluded the realization of a single ubiquitous network for the federal government, one of the program's original goals.

The problems with price and service delivery are in large measure due to the incentives of the contract itself. The three main administrative pricing mechanisms have been ineffective because they fail to provide the vendors with proper incentives. While the threat of recompetition may be having some beneficial influence, recompetitions are held too infrequently. Further, recompetition considerations other than price mitigate the incentives that recompetition has for the vendors. The other main pricing mechanism, the publicly available price cap (PAP cap) has not only been ineffective, it has harmed the administration of the contract. Attempts to enforce alleged PAP cap violations gave rise to a chain of events ending in a damaging series of Congressional investigations. The existence of the PAP cap has increased the adversarial nature of relations between GSA,

the vendors and the Congress. Further, the existence of the PAP cap will continue to cloud GSA's relationship with Congress.

This poor relationship has distracted GSA from the main task of managing the FTS2000 program. As such, GSA has been less responsive to the complaints of user agencies. A further ill effect has been on the development of new services. Specifically, GSA would probably be rebuffed by Congress if it sought to resolve the interoperability issue by seeking funds to share the risk of gateway development with the vendors. However, a risk-sharing arrangement is an appropriate way to develop interoperability and resolve the current impasse.

B. RECOMMENDATIONS

Developing interoperable gateways under a risk-sharing arrangement is the first recommendation for improving the FTS2000 program. However, such a proposal must be bundled with an overall reform of the program to be palatable to the Congressional leadership. Such a reform must promise to bring FTS2000 prices closer to comparable prices than has been the history to date. To maintain pressure for price reductions, more frequent competition, on an annual basis, is recommended. Further, to add leverage to GSA's negotiating position, GSA should have the flexibility of meeting new circuit requirements outside the FTS2000 program when FTS2000 prices are too high.

An additional method of reducing FTS2000 costs would be an annual review of system cost-causers. At such a review, GSA and the vendors should review those requirements whose elimination or reduction should allow the vendors to lower FTS2000

prices. The government and the vendors would share in the cost savings from such an effort. It is envisioned that this cooperative effort would reduce some of the antagonism between GSA and the vendors. Further, such an annual review should also be a forum to introduce proposals for new services.

Regardless of the cost savings found at the annual reviews, GSA also must insist on marginal pricing for service features whenever appropriate. For instance, user agencies should be able to decide if they want to pay for advance billing features and call detail records. Providing such services to all agencies needlessly escalates total system costs. Weighing the benefits against the costs of these features is best accomplished by the agencies who directly experience the value of these features themselves.

Finally, implementing these recommendations will involve the difficult task of convincing Congress that the proposed changes are necessary. The most difficult obstacle will be to get the mandatory use legislation changed. Such a change is needed so that services can be obtained outside FTS2000 to increase competition. However, the Chairman of the House Government Operations Committee has consistently spoken out in favor of mandatory use. On the other hand, the Congressional leadership has also expressed adherence to two principals which could properly be cited to justify change. First, Congress has sought the lowest possible cost to the government. Second, they have expressed enthusiasm for competition as a means of holding down prices. Showing how the above recommendations will increase competition and lower prices is the best way to convince Congress of the need to implement change.

Given GSA's stormy history with Congress, the impetus for change should come from another government agency. The Office of Management and Budget is a good candidate for this task; they could rightly stress the savings associated with proposed changes. Further, the vendors and user agencies must be convinced that reform is in their best interest. They could then bring their influence to bear upon the Congress. For the vendors, change would bring them less bad publicity, a chance to share in cost savings, and the cooperative development of new services enhancing the contract value. For the user agencies, change would bring lowered prices and a timetable for developing new services. If the proposed changes resulted in a better managed and lower cost contract that delivered more services, who could argue with that? A summary of these recommendations is contained in Figure 9 below.

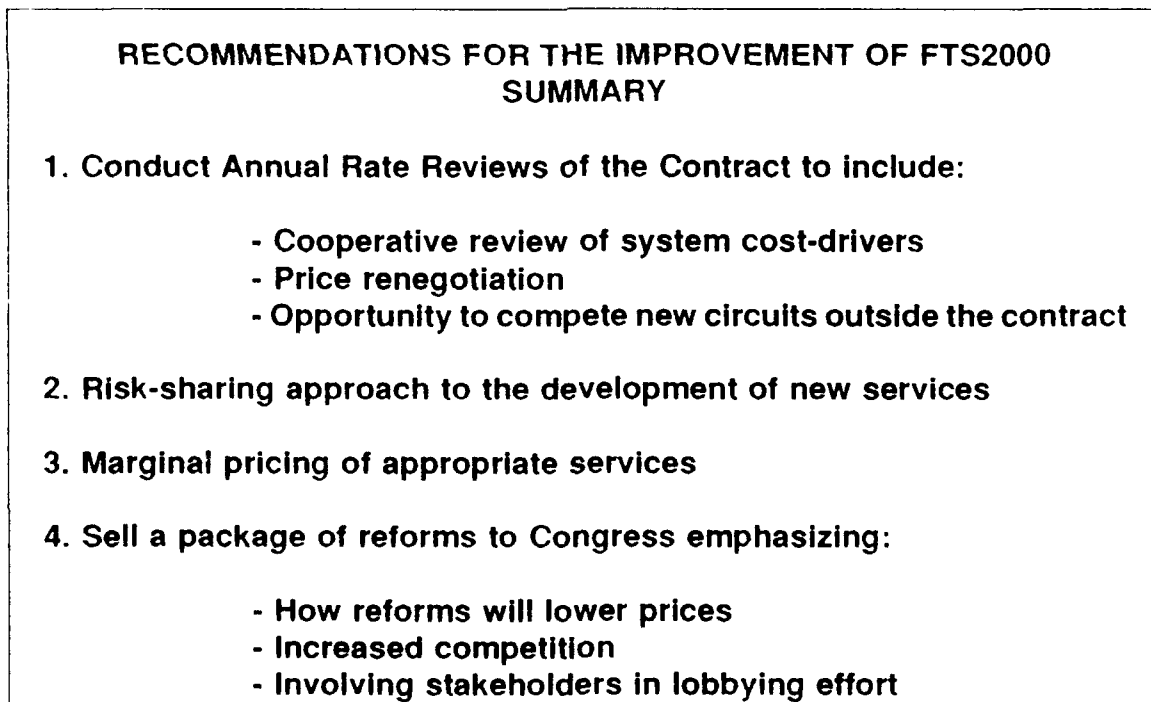


Figure 9

C. AREAS FOR FURTHER RESEARCH

One of the principals mentioned above, that competition leads to better prices, has not been proved in the case of duopoly. The coming recompetition in FTS2000 will yield a research opportunity for examining the effects of competition on duopoly. Studies of duopolistic competition in weapons procurement have been clouded by technology transfer issues, which will be absent in the FTS2000 recompetition.

Additionally, the latent effects of potential competition outside an existing contract are an issue only briefly discussed in this thesis. Specifically, an examination of the Defense Commercial Telecommunications Network (DCTN) program would be a fruitful area of research because some of the above recommendations are already in place in that program.

Finally, if the recommendations of this thesis are ever implemented, an analysis of their effects could add to the body of knowledge concerned with large telecommunications contracts.

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APPENDIX A. FTS2000 SERVICES AND PRICING

The purpose of this appendix is to provide the reader with a ready reference guide detailing FTS2000 services, features and their associated pricing structure. The services and features described in this section are common to both networks. However, because this thesis is written primarily for Department of Defense (DoD) readers, the detailed description of features pertains to Network A, which serves DoD.

A. SWITCHED VOICE SERVICE (SVS)

Switched Voice Service (SVS) is the primary service that replaced the old FTS Network. It supports connections for voice circuits and modem speeds up to 4800 bps. All on-net users dial a seven digit number to reach other on-net locations. Virtual-on-net (VON) users must use switched access and ten digit dialing. In general, virtual-on-net stations are locations for which on-net service and feature capabilities are not available, because of call volumes or location. (AT&T, 1991, pp.4.1-4.2)

Service features are described below:

1. Agency Recorded Announcements

Agency announcements, up to three minutes in length, are assigned an FTS2000 seven digit number. Users may record their own announcements, or submit text for AT&T to make the recording. Announcements are digitally stored and played, resulting in no barge-in (complete announcement played from the beginning.) (AT&T, 1991, pp.4.3-4.4)

2. Attendant Services

Live attendants can provide on-line assistance 24 hours a day, Monday through Friday, except federal holidays. Services supported by attendants include:

- Audio conference setup and reservations
- Call completion and user assistance
- Locator service (directory assistance for main agency numbers)
- Authorization code verification
- Billing inquiries, credits, and adjustment assistance, and user complaints
- Video teleconferencing reservations

(AT&T, 1991, p.4.4)

3. Authorization Codes

Authorization codes are provided to allow users to control class of service privileges and to generate off-net calls. When dialing a call, the network prompts a user to enter an authorization code only when the class of service associated with the originating stations provides insufficient privileges to complete the call. Entry of the authorization code assigns the billing of the call to the authorization code user. (AT&T, 1991, p.4.5)

4. Call Screening

Call screening allows administrative control of call completion based on class of service. Each of the classes of service identifies both the access and feature privileges of the user. All off-net travel access users are classified into a group requiring the input

of an authorization code, so that travel access is restricted only to valid authorized users. The code block feature provides screening of calls to specified area codes, exchange codes, and countries. Code blocks may not be overridden with authorization codes. (AT&T, 1991, p.4.5)

5. Network Audio Teleconferencing

A network audio teleconference may be setup from between three to fifty-five conferees. Conferences may be initiated in a number of ways. Users may initiate a conference by dialing the conference bridge directly. A variety of reservation options also exist. Audio conferencing setup requires a valid authorization code. (AT&T, 1991, p.4.6)

6. Inward Station Access

This is essentially an 800 service which allows toll-free calling to government agencies. (AT&T, 1991, p.4.7)

7. Expanded Inward Access Features (EIAF)

Expanded Inward Access Features (EIAF) are similar to the advance 800 features offered by AT&T and other major carriers. They are available in two Feature Packages, I and II. Each package includes selected automatic routing features. EIAF routing features include:

- NPA and NXX Routing - Allows routing of 800 call based on caller area code (NPA) and exchange (NXX).
- Time of Day Routing - Allows routing of 800 calls in 15-minute increments
- Day of Week Routing

- Call Distribution Routing - Allows agencies to specify the percentage of calls to be directed to two or more service delivery points (SDPs).
- Command Routing I - Allows agencies to make changes to routing features on demand. Changes may be made in under ten minutes. Requires Routing Control Service I.
- Command Routing II - Allows agencies to make changes to routing features on demand, with addition that preplanned routing changes can be stored in the network, for more rapid implementation. Changes may be made in under five minutes. Requires Routing Control Service II.
- Routing Control Service I - Allows agencies direct access to network support system to review current or pending routing plans.
- Routing Control Service II - Allows agencies direct access to network support system to review current or pending routing plans. It has the additional advantage of allowing changes in routing without a service order initiation.
- Recorded Announcements - Allows routing of calls to a pre-recorded announcement of up to 30 seconds. Used in conjunction with other routing features.
- Selection Announcements - Allows agency to route calls based upon the selection of additional touch-tone digits by the caller.

EIAF non-routing features include:

- Call Attempt Profile - Provides a daily report of call attempts to an 800 number by area code and time of day.
- Dialed Number Identification Service - Allows the subscriber with multiple inward access numbers that terminate at the same service delivery point to identify the specific number that was dialed.
- Make Busy Arrangement - Allows an agency to make one or more access lines to appear busy.
- Peg count and Overflow Peg Count Access - Allows an agency to obtain peg count information on a real time basis, which can be displayed on a terminal provided by the subscriber.

- **Management Information Report** - Provides the subscriber with specific details of Feature Package II usage such as number of calls by area code, number of blocked calls, duration of calls, and other information.

Feature Package I includes NPA routing, Time-of-day routing, Day-of-week routing and all non-routing features except the Management Information Report. Feature Package II includes all features. (AT&T, 1991, pp.4.7-4.11)

8. Inward Selected Access

Inward Selected Access provides toll-free inward access to selected on-net stations for the public via dual-tone multi-frequency (touch-tone) telephones. A user dialing the appropriate 800 number is prompted by an announcement to indicate a desired on-net destination. This feature provides the benefits of inward station access plus allowing incoming calls to be separated by function. (AT&T, 1991, pp.4.11-4.12)

9. National Security Emergency Preparedness (NSEP)

National Security Emergency Preparedness (NSEP) assures continuity to users under emergency overload conditions. The NSEP provides critical user access for FTS2000 voice traffic during emergencies or overload periods on the public switched network. Other capabilities of NSEP include: interoperability with other, non-AT&T networks, emergency management capabilities, signalling systems encryption, and satellite command link protection. The following is a brief description of NSEP features:

- **Assured Service** - Provides Critical Users precedence and priority over the network. Such a call is identified for special routing treatment and given precedence over other calls as it continues across the network.
- **Critical Users** - Can be homed on multiple service nodes within the network. Dedicated Transmission Service is used to reach the second service node. Calls can

be originated through either node. Critical Users can subscribe to special access routing via Physically Diverse Paths. These features help to protect against failures in the access from the user location to the service nodes.

- **Authorization Code** - A Critical User may request a "Critical User Authorization Code." This authorization code is used when calling from some on-network locations or an off-network location.
- **Telecommunications Service Priority (TSP)** - Can be requested through the FCC/NCS (National Communications System). Users who qualify receive priority treatment, according to their TSP authorization.

(AT&T, 1991, pp.4.12-4.13)

10. Switched Voice Service (SVS) Feature Pricing

Basic service pricing is described in Chapter III of the thesis. Pricing for SVS features are described in the following table. The pricing is in addition to the origin access, transport, and termination access charges for basic switched voice service. The table indicates whether each feature incurs a one-time non-recurring charge, a monthly charge, or a usage based charge.

B. ELECTRONIC MAIL (FTS2000MAIL)

FTS2000Mail is a service feature residing within the Packet Switched Service or Switched Voice Service. FTS2000Mail supports connectivity to other e-mail systems through an X.400 gateway. In addition to electronic delivery, hard copy delivery of messages is available through print out at subscriber site, courier delivery, delivery via U.S. Mail, or via G-3 facsimile machine. Service features are grouped into three types: Basic, Standard, and Enhanced. A fourth group, called Special Accounts, is allowed to

Table 1 Switched Voice Service Feature Pricing

Feature	Pricing Unit	One time charge	Per month charge	Usage charge
Recorded Announcement	30-second duration per message. Normal call charges to user.		X	
Attendant Services				
Audio conference	Per conferee per call			X
Locator Service	Per call			X
Authorization code verification	Per verification			X
Authorization Codes	Per code authorization	X	X	
	Per automatic verification			X
Call Screening				
Class of Service (COS) Restrictions	Initiated or changed Per service order	X		
COS Override	Per override			X
Code Block	Initiated or changed Per service order	X		
Inward Selected Access	Per number and per call		X	X
Inward Station Access	Per 800 Number		X	
Expanded Inward Access Features				
Feature Package I Routing	Per installation or change	X	X	
Routing Control Service I	Installation and connect min.	X	X	X
Feature Package II Automatic Routing (NPA, Time-of-day, etc.)	Per installation, and based on number of nodes in decision tree	X	X	
Feature Package II Additional Routing	Per installation and per call	X	X	X
Network Audio Conferencing	Per Bridge Port per Minute Reservation Charge per port			X

Source: AT&T, 1991, pp.13.16-13.19

connect a custom E-mail network with FTS2000Mail through a special gateway. The type of gateways offered on Network A include: X.400, UNIX, LAN, Synchronous (3770.3780), and IBM PROFS gateways. The table on the following page illustrates the features offered under various service types.

C. PACKET SWITCHED SERVICES (PSS)

Packet Switched Services (PSS) is an X.25-compatible data transfer service. Network A PSS uses the same packet switching technology as AT&T's Accunet Packet Service. Access speeds vary from 300 bps to 56 kbps. Access protocols include asynchronous access, X.25, X.32, and various proprietary protocols. Access methods include: dial-up analog, dedicated analog, and dedicated digital access. 56 kbps access is available only with dedicated, digital X.25 access. (AT&T, 1991, pp.6.1-6.4) In addition to access and transportation charges, PSS incurs a usage based charge for conversions from protocols other than X.25. (AT&T, 1991, p.13.32) PSS includes fifteen service features. However, except for the use of FTS2000Mail, there are no feature based prices for PSS.

Table 2 FTS2000MAIL Services and Features

FTS2000MAIL FEATURE	BASIC SERVICE	STANDARD SERVICE	ENHANCED SERVICE
Domestic Telex	X	X	X
Courier Delivery	X	X	X
Remote Printer	X	X	X
Directory Look-Up	X	X	X
PostScript Language Support	X	X	X
True Binary Transparency	X	X	X
Auto Answer (Like an answering machine)	X	X	X
Mailing Lists	X	X	X
Auto Forward		X	X
Return Receipt		X	X
Postal Delivery		X	X
COD (Receiver pays for msg)		X	X
Calls to X.400 Gateway		X	X
Shared Lists		X	X
Shared Folders Access		X	X
Forms/Files	X		X
Shared Folder Ownership (Private BBS)			X
Text-to-Fax (MAILFAX)			X
Text-to-Voice (MAILTALK)			X
Auto Response			X

Source: AT&T, 1991, pp.7.1-7.7

D. SWITCHED DATA SERVICES (SDS)

Switched Data Services (SDS) provides a synchronous, full-duplex circuit-switched data service at 56 kbps. When full ISDN capability is implemented on the network, this will evolve to 64 kbps. Other capabilities include:

- Dial-up service
- Use of authorization codes
- Network-derived clocking for data terminal equipment
- Delivery of service directly to the data terminal equipment (DTE) or indirectly through a digital private branch exchange (PBX).

Only the "authorization code" feature incurs additional pricing, including a one time fee, a monthly recurring charge per code, and a charge per verification. The network is designed to provide a 7.0% (P.07) busy-hour, busy-day, busy-month grade-of-service (GOS). (AT&T, 1991, pp.5.1-5.3)

E. DEDICATED TRANSMISSION SERVICES (DTS)

Dedicated Transmission Services (DTS) provides dedicated, point-to-point, private line service. A description of the three types of service follows:

- **Dedicated Analog Service** - Provides voice and voice/data service at speeds up to 9.6 kbps. Access can be through voice grade private line or through SDIS, described later in this section.
- **Dedicated Digital Service** - provides synchronous, full-duplex, 9.6 or 56/64 kbps transmission service.
- **Dedicated T1 Service** - provides non-channelized T1 circuits at 1.544 Mbps using extended superframe format (ESF). (AT&T, 1991, pp.9.1-9.3)

Pricing for DTS services consists of an initiation charge and monthly charges for originating and terminating access and a mileage sensitive transport charge (AT&T, 1991, p.13.35).

F. VIDEO TRANSMISSION SERVICE

There are two versions of video transmission services offered under FTS2000, compressed video transmission service (CVTS) and wideband video transmission service (WVTS).

1. Compressed Video Transmission Service (CVTS)

Compressed Video Transmission Service (CVTS) offers "near full motion" video services operating at 384 kbps. (Network B CVTS operates at 768 kbps.) CVTS must be ordered through a reservation system. CVTS security is assured through the use of government-provided encryption. CVTS is offered in the following forms:

- Two-way point-to-point
- Multipoint broadcast with interactive audio
- Dynamic Multipoint

The video room and its equipment must be provided by the government. (AT&T, 1991, pp.8.1-8.6).

Monthly charges for CVTS include a receive only service ready availability charge, transmit and receive service ready availability charges, and encryption readiness charges. In addition to network origination and termination access charges and network

transport charges, usage charges include a charge for each station participating in a videoconference. (AT&T, 1991, p.13.33)

2. Wideband Video Transmission Service (WVTS)

Wideband Video Transmission Service (WVTS) is an analog transmission service offering full motion video over satellite links. There are two types of WVTS: one-way point-to-point and multiple broadcast with audio return. As with CVTS, the teleconferencing room, video and audio equipment for this service must be provided by the government. (AT&T, 1991, pp.8.1-8.13)

G. SWITCHED DIGITAL INTEGRATED SERVICE (SDIS)

Switched Digital Integrated Service (SDIS) is essentially an access arrangement for other services and features. It provides all-digital, dedicated access to the network. SDIS provides two types of digital interfaces, ISDN and T1. The ISDN interface is partially implemented. T1 interface types are provided through standard Pulse Code Modulation (PCM) coding and ESF format or through M44 format utilizing Adaptive Differential PCM (ADPCM) coding. The main benefit of SDIS access is lowered costs through volume aggregation. Other benefits include access alternatives and ease of service evolution to ISDN. (AT&T, 1991, pp.10.1-10.8)

The access charges for SDIS are volume discounted as are the access charges for most of the other service offerings. However, by aggregating services, a greater volume discount can be achieved under SDIS. User agencies must supply their own multiplexing equipment. However, the cost of such equipment is quickly recouped from the savings

with SDIS access, which can be on the order of thousands of dollars per month. SDIS service pricing other than access charges is based on the feature, transport, and termination charges described in the previous sections. (AT&T, 1991, pp.13.26-13.28)

H. GENERAL NOTES ON SERVICE PRICING

Usage based charges for most services fall into the following categories:

- **Originating Access Charges** - Based on access area and an applicable volume discount.
- **Network Transport Charges** - Based on a table listing Access Area Pairs, sensitive to distance, but not volume, except when the network as a whole receives a volume discount based on established contract clauses.
- **Terminating Access Charges** - Like originating access charges, based on Access Area and an applicable volume discount.
- **Feature Charges** - are applied for each feature used as described in the subsections describing each service.

Other determinants of service pricing include:

- **Six-second increments** - This is the basic pricing unit for calls priced according to duration (SVS, SDS, VTS, SDIS, and dial-up PSS). This is not subject to fractional pricing. An SVS call of 50 seconds would be charged for nine increments.
- **Initial period** - The first six seconds of an SVS, SDS, and dial-up PSS call are treated as a unit for pricing purposes and charged a higher rate than subsequent six second periods.
- **Time of day** - Calls made during the "Normal Business Day" (Monday through Friday, 8:00 a.m. to 5:00 p.m., less holidays) are charged at a higher rate than calls made at "Other than Normal Business Day."
- **Kilosegment** - This is the basic pricing unit to determine non-dial-up PSS charges. A kilosegment consists of 1,000 segments containing 64 octets each. Charges for fractional kilosegments are pro-rated.

(AT&T, 1991, pp.13.10-13.11)

APPENDIX B: VENDOR ADVERTISEMENTS AND OTHER QUOTES

A. VENDOR ADVERTISEMENTS

On the following three pages are examples of advertising from the three major long-distance carriers concerning their participation (or lack thereof) in FTS2000. These figures are included to give the reader a awareness for the depth of feeling associated with the vendor's public statements concerning FTS2000.

B. QUOTES

The following quotes are included to indicate the tone of some of the discussions concerning the FTS2000 program. Quotes are arranged according to the organization of the individual making them.

1. MCI

MCI vice-president of government systems, Jerry Edgerton, commenting on a report that the FTS2000 vendors would have to make a certification that their prices met the PAP cap:

"They [AT&T and US Sprint] will have to cut out all the crap about how their services to the government are unique and different." (Bass, 1991d, p.45)

**MCI**

Why ...

does the Federal Government pay more for FTS2000 services than big corporations pay for the same telecommunications services. It just doesn't make sense.

Our government buys more communications services than any other organization in the world.

The federal deficit is growing and most agencies have been told to cut costs and do more with less.

Under MCI's Tariff 7, federal agencies can purchase voice, data and videoconferencing services up to 30% below FTS2000 rates.

TALK ABOUT DEFICIT REDUCTION

For more information on the wide variety of cost effective services MCI offers the government, call MCI today at:

1-800-333-7005

Copyright MCI Telecommunications Corporation 1991

Figure 10 MCI Advertisement

Source: *Government Executive*, September, 1991.

1975: Launches the first U.S. public data network. 1979: Jumps the first commercial private mobile network. 1980: Launches the first major public e-mail service. 1985: Sends messages to the world's first pager. 1986: First nationwide long-distance toll-free service. 1987: Sends million Mbit/sec. network to the first user.

THE BEST DEFENSE AGAINST HURRICANES, EARTHQUAKES, AND DROPPED DECIMAL POINTS.

In business, it's important to have the most reliable data network. In government, it's critical.


You need the highest possible level of accuracy, survivability, and availability. That's why you should know about the Sprint® network. From the very beginning, it was made to give you all three.

With our flat architecture built-in redundancy, and automatic rerouting, we survived both Hurricane Hugo and the 1989 San Francisco earthquake. With absolutely no interruption in service.

And when it comes to accuracy, the network has 100% fiber optic transmission. So it's the best medium for error-free communication. And it has 100% digital switches. Which makes it a perfect fit for critical government applications like bulk file transfers, Videoconferencing, And interactive CAD/CAM.

And these are just the features of our basic network. At our Government Systems Division, we can offer any level of redundancy you need. The highest level of uptime. And custom engineering that fits your exact needs.

If you'd like to know more, call 1-800-366-9888. And we'll show you the best protection against disasters. Whether they're made by nature or by machine.

 **Sprint.**

1988: Sprint completes the first nationwide 100% digital fiber optic network. Sprint awarded 40% of FTS 2000 contract. 1989: World's first and largest private-to-private transmission fiber optic cable completed. 1990: Sprint announces first commercial mobile network to the Sprint User. Sprint introduces first nationwide GSM capabilities.

Figure 11 US Sprint Advertisement Source: Government Executive, July, 1991.

The EPA's AT&T FTS2000 Video Conferencing Service works so well, they decided to add a little something.

19 fully configured
video conference centers.

The Environmental Protection Agency knows — there's no way to tell how a system will work, until you put it to work.

So they ran a three site pilot test of AT&T's FTS2000 Video Conferencing Service capabilities. The results were so impressive, they decided to make a major investment in 19 nationwide conference centers.

Now AT&T FTS2000 is improving the

productivity of EPA personnel nationwide. Providing savings in travel expense. And enhancing the EPA's overall environmental control efforts.

Let us show you how AT&T's FTS2000 Video Conferencing Service can make an impact on your business and budget objectives.

For more information, or to arrange a demonstration, just give AT&T a call at 1 800 253-3846, ext. 103.



AT&T

The right choice.

Figure 12 AT&T Advertisement

Source: *Government Executive*, July, 1991.

2. US Sprint

US Sprint official after the announcement that the Navy would revert to AT&T:

"This will just perpetuate the AT&T monopoly at DoD." (Griswold, 1991)

US Sprint president of Government Systems Division, Chris Rooney, commenting on the lack of a 60/40 split:

"They [AT&T] have 100 agencies assigned, and we have 35, they could have achieved the 60 percent within those 100 agencies." (Bass, 1991a, p.37)

US Sprint spokesperson, commenting on MCI's GTS offering:

"Since that time [when MCI's bid failed], MCI, as a disappointed bidder, has made numerous legal challenges to the award, and each challenge has been defeated. MCI has exhausted all legitimate means of recourse and is proposing this as a 'last ditch' effort." (Edge, 1991b, p.5)

3. The Senate

Sen. John Glenn taking Richard Austin to task for GSA's decision to eliminate levelized pricing for non-mandatory users:

"GSA has set a dubious precedent, namely, a willingness to sacrifice long-term health of FTS 2000 for an unverified short-term fix. It not only has obfuscated pricing and subsidy issues, but also has opened the door for agencies to escape from the system." (Glenn, 1991, p.3)

4. Network A Users' Forum

In July 1991, representatives of agencies using FTS2000 Network A, met for a user's forum. While the tenor of the conference was generally good, some comments showed the frustrations of users:

"Agencies want to see correct billing from GSA."

"What are agencies supposed to do when they find prices lower than FTS2000? Is the PAPCAP enforced?"

"Service orders need better coordination, there is a lack of technical information such as timing, framing, coding, etc."

(Dolezal, 1991, p.6)

5. GSA

Michael Corrigan in a *Network World* interview:

"Q. Do you save money on data?"

"A. Well, we think so. It depends on the specifics of the circumstances..."

(Strauss, 1991, p.24)

6. AT&T

AT&T chairman and CEO Robert Allen explaining AT&T's protest with the Board of Contract Appeals over the assignment of the Navy to US Sprint:

"We have been waiting politely and rather quietly, encouraging the achievement of that 60-40 split, and we've never even gotten close. Then we have seen some specific actions which seem to suggest there's not a good faith attempt to even realize the terms of the contract. It's certainly not satisfactory and it's not in line with what we expected."

(Schwartz, 1991b, p.7)

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